



**Faculty of Information and Communication Technology**  
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**AGENT TECHNOLOGY APPROACH TO IMPROVE KUIM**  
**LEAVE MANAGEMENT SYSTEM**

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**(Software Engineering and Intelligence)**

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**AGENT TECHNOLOGY APPROACH TO IMPROVE KUIM LEAVE  
MANAGEMENT SYSTEM**

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**A project submitted**

**in fulfillment of the requirements for the degree of Master of Computer Science  
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## DECLARATION

I declare that this project entitle “Agent Technology Approach to Improve KUIM Leave Management System” is the result of my own research except as cited in the references. The project has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : .....

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Date : **25 JUNE 2010**

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## ABSTRACT

Malacca Islamic College University is a centre of higher learning institution owned by the Malacca state government which has about 150 employees. The staff used the leave system to take annual leave. However, there are some problems faced by the leave system. There is no specific process for Head Of Department to approve the staff's leave when no reference to the event in KUIM, public holidays and tasks for each employee in KUIM. It is difficult for Head Of Department to confirm the leave if the program does not know which event will take place in KUIM. Moreover, there is also Head Of Department who did not know the tasks of their employee before approving the leave. Therefore, the objectives of this study are to create a device that can help the head of department to control and monitor the event to be held in KUIM program throughout the year, holidays and tasks for each employee in KUIM. The proposed method to develop the new leave system is agent technology. This agent is a method that helps to overcome the problem faced by the existing KUIM leave system. Benefit from the new leave system is the head of department able to monitor the program and tasks in KUIM before approving their application. When it's done, the LMS leave system will get two system tool which is KUIM event and KUIM employee task. There is also a tool for public holiday for the staff to refer when applying leave. Ultimately, this agent tool can overcome the problem faced by the existing KUIM leave system. However, this system requires further enhancement to facilitate the head of department to approve the staff application.

## ABSTRAK

Kolej Universiti Islam Melaka (KUIM) adalah sebuah pusat pengajian tinggi milik kerajaan negeri Melaka yang mana mempunyai seramai 150 kakitangan. Kakitangan KUIM menggunakan system cuti untuk mengambil cuti tahunan. Walaubagaimanapun, terdapat beberapa masalah yang dihadapi oleh sistem cuti KUIM yang mana tidak terdapat proses khusus untuk Ketua Jabatan meluluskan cuti kakitangan apabila tiada rujukan kepada program di KUIM, cuti umum dan tugas setiap kakitangan KUIM. Hal ini menyukarkan ketua jabatan untuk mengesahkan atau meluluskan cuti kerana mereka tidak mengetahui program yang akan berlangsung di KUIM. Malah terdapat juga ketua jabatan yang tidak mengetahui tugas kakitangan dibawah seliaan mereka sebelum meluluskan cuti. Justeru kajian ini mencadangkan agar untuk diwujudkan perkakasan-perkakasan yang boleh membantu ketua jabatan untuk mengawal dan memantau program KUIM yang akan berlansung sepanjang tahun, cuti – cuti umum dan tugas kerja setiap kakitangan KUIM. Cadangan kaedah yang digunakan untuk membangunkan sistem cuti yang baru ini adalah menggunakan teknologi Agen. Teknologi ini adalah kaedah yang membantu untuk mengatasi masalah yang dihadapi oleh sistem cuti KUIM sebelum ini. Faedah dari sistem cuti yang baru ialah ia akan dapat membantu Ketua Jabatan mengawasi dan memantau program KUIM dan tugas kerja kakitangan sebelum memohon cuti. Apabila sistem Cuti LMS siap akan terdapat dua sistem perkakasan iaitu Program KUIM dan Tugas Kerja. Malah terdapat perkakasa untuk cuti umum di mana kakitangan boleh melihat cuti umum yang diambil semasa memohon cuti. Sebagai penyelesaian, Agen ini dapat memperbaiki proses sistem cuti KUIM tetapi memerlukan penambahbaikan lanjutan. Penambahbaikan tersebut termasuklah keperluan untuk menambahkan perkakasan-perkakasan pada sistem cuti KUIM bagi memudahkan ketua jabatan dan kakitangan KUIM untuk menggunakan sistem cuti untuk permohonan dan kelulusan KUIM.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Leave Management System (LMS) is a system being used by Human Resource Department all over the world. The particular systems are Management System, Payroll System, Employee System and Leave Management System. LMS is used by the employee when they want to apply for leave. Employee will use the LMS system by filling the desired date. Nowadays the usage of LMS has grown in many sectors with various type of tools and features used to assists their company to keep tracks and record of the employee's leave .

Usually the employee will manually apply their leave by filling up the leave application form. They must also need to provide relevant information about their leave such as the duration of the leave. Then they will have to submit the application form to the Head of Department to approve their application. When the Head of Department (HOD) has approved the leave application form, the form will then be submitted to upper management in order to verify that the employee is not bond to any of the company's activities. After that the employee will know whether the leave is approved or not. This process is inefficient especially when the employee has to wait for approval .

This happens because they might be very busy with their work. Even sometimes there are cases such as the lost of leave form and the employee would not know the status of their leave application.

However, the system in KUIM allows employees to apply for leave using KUIM leave system. It will accept applications and send it to the HOD. HOD will approve the application for staff on leave. KUIM leave system will be provided at all computers in KUIM so that it can be used easily by all the employees. KUIM LMS will be improved from time to time by the company's organization.

## **1.2 Problem Statement**

They are two major problems in KUIM LMS which are:

- a) Unable to identify the task for each of employee in KUIM.

It is very difficult for the head of departments to identify whether the applicant who take the leave has settled all their task previously and no task at all during the leave date, If the staff happens to have a task to do on leave date, the staff must finish the task before he or she take the leave or replace other staff to continue the task. The problem in LMS is that they not provide report task of Staff Company to define whether the staff have task on the date of the leave. Head of department could only give approve to the staff when application form appear the LMS system without leaving their identity and task

- b) Unable to identify the program held in KUIM.

LMS don't have a report regarding on important event in KUIM such as Convocation Ceremony, Graduation Night, Orientation Programme and so on. The HOD is facing the problem to approve staff leave because they are uncertain about an important event in

KUIM. If the LMS have a report from top Management regarding the important Event in KUIM, the HOD will not approve their application.

### **1.3 Objectives of the Project**

The main objectives of this project can be summarised in the following points:

- a) To design and develop an Intelligent Leave Management System by enhancing the current system of LMS in KUIM.
- b) To improve the LMS by utilising Intelligent Agent method in KUIM LMS.

### **1.4 Contributions of the Project**

A major contribution of the project is the task of work and the event of company embedded in the KUIM leave system. It also helps the HOD to monitor their staff assignments and follow the schedule event throughout the year.. The benefits are the tool can be used by HOD to ensure that the approval is made by referring the event in KUIM and they had done their task before applying for leave. The LMS also enhanced with agent technology.

### **1.5 Project Methodology**

The project methodology that has been adopted in this project is intended to solve the research problem and to achieve project objectives. It consists of several stages as follows:



a) Literature review.

The purpose of the literature review is to enrich all relevant underlying knowledge as well as to create a tool for HOD to approve their staff leave application.

These include:

- General information about application of LMS
- Reliability and decision analysis approach for LMS problem.

Based on literature review, some strength and weakness of the current systems are analysed and finally highlighted the proposed solutions. The detail of the literature review is presented further in Chapter 2 of this thesis.

b) The development of the tool.

Definition and requirement analysis:

- A user friendliness and ease of use facilities that could assist Head of department in decision making.

- Tool design:
  - Agent Technology.
  - Software requirement:
    - *PHP and SQL*

Details of the development of the tool are presented further in Chapter 3 of this project.

c) The testing of the tool.

- Verify the new tools features in LMS
- Validate the tools via usability and user interface.
- Verify new tool features for LMS

Details of the testing are presented further in Chapter 5 of this thesis.

## **1.6 Thesis Organisation**

This thesis is divided into five chapters. Chapter 1 is an introduction and overview of the conducted research. This chapter will introduce the issues in the Leave Management System and its application. Problem statements, project objectives, project contribution, methodology and summary of the project outcomes also will be discussed.

Chapter 2 consists of literature review related to background of LMS. The existing study and project its applications also will be analysed and discussed.

Chapter 3 discusses the detailed weaknesses of method model and proposed New features Tool for LMS. A detailed design of Agent Intelligent method together with flow Diagram of LMS detail.

Chapter 4 discusses on the implementation testing phase which includes the new features tools service for LMS .The testing outcomes will also be discussed.

Chapter 5 focuses on the discussion about the conclusions of the research outcomes and recommendations according to the stated objectives. This chapter ends with the discussion of the final conclusions and recommendations.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

This Chapter describes and explain on the literature review carried out on the system and that be used in developing this system, literature review is a body of text that aims to review the critical point of current knowledge on a particular topic. Therefore, the purpose of the literature review is to find, read and analyze the body of literature or any works of studies related to this renting system.

Literature review identifies the purpose and structure of the literature review that supports this research effort. The purpose of the literature review is to identify and synthesize appropriate references to demonstrate and illustrate the presence of knowledge gaps to be addressed by this research. These references include journal articles, conference papers, published reports, and other readily available sources of information, such as selected *World Wide Web* pages from the Internet.

## **2.2 Existing System**

In this section, It will discuss about the existing system that can access on line, There are several examples of examples of existing system and have their own purpose and function:-

### **2.2.1 Absentee System (AMS)**

The definition, causes, affects on productivity, and costs of absenteeism are quite clear. The challenge is to develop methods that support attendance and control absenteeism, in such a way as not to create mistrust, costly administrative procedures and systems avoidance. Traditional methods of absenteeism control exclusively utilizing disciplinary procedures have proven to be ineffective. It is almost impossible to create a fair disciplinary procedure, because even well run disciplinary systems, which treat similar actions with consistent repercussions, are usually seen as unfair. This perception is common, because discipline alone neither identifies nor addresses the root causes of absenteeism. Every employee who takes time off in defiance of company regulations has reasons, which they believe justifies their actions. Unless a management attendance program identifies and addresses the causes of employee absenteeism, it will be ineffective and viewed as unfair. Traditional disciplinary programs alone can, at best, give the illusion of control. It is no secret that there are ways to beat even the best systems. The fear of discipline often only increases the desire to avoid management systems ( Keogh ,2006).

If absenteeism is to be controlled, the physical and emotional needs of employees must be addressed. In a 1985 study on "Rates of Absence among Nurses" it was found that 50% of absenteeism could be controlled through attending to employees" physical and emotional needs.

### **2.2.1.1 Purpose of Attendance and Management**

The purpose of attendance management is to develop a willingness on the part of all employees to attend work regularly and to assist them in motivating their co-workers to attend work regularly (Pooja Rai ,2007). This can be done through;

- a) Addressing the physical and emotional needs of employees
- b) Communicating the attendance goals of the organization so employees can understand and identify with them
- c) Dealing with cases of excessive absenteeism effectively and fairly to produce deterrence.

Successful administration of an attendance management program requires managers and supervisors to be aware of, and to create work environments in which the following can be actualized.

- a) The greater the extent to which individuals identify with the goals of the organization and care what happens to it, the greater their motivation to be regular in attendance.
- b) The more that people find their jobs meaningful to them, the greater their motivation to be regular in attendance.
- c) As employees' workloads increase due to the absence of a co-worker, peer pressure is exerted on the absent co-worker to attend work on a regular basis.
- d) The more people like working for the organization, the higher their motivation to attend regularly. Recognition of good employee attendance helps improve attendance.
- e) Employees will have a lower absence ratio if they feel free to discuss their on-the-job problems with their immediate supervisor.

- f) Employees with a low absence ratio feel confidence and have supportive relationships in their workplace. Low absence ratio employees are found to be more satisfied with their opportunity for promotion and upgrading.

### **2.2.1.2 Commitment to Attendance**

This paper provides the information necessary to begin an effective attendance management program, which will yield long-term results. This paper is intended to be a guide rather than an instruction manual or policy. To make an attendance management program truly successful, it will require insight into the special dynamics present in your work place. It will require two-way communication, as both the needs of the employees and of management must be met if good attendance is to be achieved. Attendance is the responsibility of everyone, especially those who directly manage the human resources of your organization.

Attendance is not only an expectation; employers have the right to receive good attendance. Each and every employee has a contractual obligation to attend work regularly. All levels of management must believe in, be committed to, and communicate their expectations of good attendance. If a specific number of sick days are considered acceptable per employee, at best that will be the result. Employees will live up to the expectations that you set for them. Expectations must be clear to both management and employees in order for an attendance management program to get maximum results. Goals must be tangible. Attendance expectations must be clearly communicated and followed.

### **2.2.2 Attendance and Leave Management System**

The Employ Wise™ Leave and Attendance module is a single leave management and attendance system that integrates these two critical HR tasks. It intelligently adapts to your policy and allows employees and their managers to manage their leaves and mark their attendance without any intervention from HR. With its powerful “push technology” Employ Wise™ ensures that employees no longer have to chase their leave requests and HR does not need to follow-up with people to reconcile their absences. Naturally, it also integrates with all other Employ Wise™ modules creating a seamless employee life cycle management system.

Employee leave management is basic HR task and one that affects all employees. Most companies have well defined leave policies that are conveyed them to employees and managers through employee handbooks or HR policy manuals. Yet HR is saddled with administrative management of leave, updating of leave balances and responding to queries on balances and entitlements from employees and their managers. Employees too find it a bother to have to fill paper forms and chase them up with approving managers. A significant amount of expensive employee, manager and HR time is wasted in a very basic HR process.

Attendance similarly is a basic HR process affecting everyone and critical as a basic input to payroll processing. HR faces problems of integrating attendance inputs from different attendance logging systems, card and biometric scanners and manual attendance registers across all business locations. Each month a lot of HR time is spent collecting and reconciling attendance data before payroll can be correctly processed. Integrating leave and attendance data is essential but not always easy. Many independent leave management and attendance software run independent of the HRIS leaving HR to keep the two sets of data in sync.

a) Benefits to the organization

- On-line attendance logging option as well provision for integration with external attendance logging systems through easy data uploads
- Plan rosters/work shifts
- Organize and monitor attendance and leave data and get reports and areas of concern
- Plan for work under absentees
- Reduction in HR intervention

b) Benefits to HR

- Automatically computes and maintains applicable leave balances displayed to the employees at the time of applying for a leave
- HR can set-up leave rules for automated rule based work-flows

c) Benefits to Employees and Managers

- Online leave Application and approval
- Allows users to define their own “In my absence” rules for HR processes of their direct reports.

### **2.2.3 Compensation and Benefits**

The Employ Wise™ Compensation and Benefits module enables you to generate accurate input data for your financial payroll software or third-party payroll processing vendor by collating data from the leave and attendance inputs, recruitment and separation processes.