

Automated Timetable Scheduling System for FTMK Direct Entry Student (ATSS)

TN. MOHD FAKHRUZZAMAN B. TN ISMAIL

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Alamat tetap : Lot 341

Km5 Jln Sultan Yahya Petra
15200 Kota Bharu
Kelantan

CIK INTAN ERMAHANI BT. ABD JALIL

Tarikh : 25 NOV 2008

Tarikh : 28/11/08

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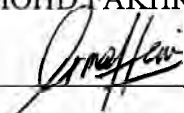
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SUPERVISOR

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ABSTRACT

Automated timetable scheduling (ATSS) is an online system that is developed for FTMK management team for construct timetable for FTMK faculty. ATSS use the technology for making the timetable more easily, faster and systematic compare to manual system that are using now because it takes longer time only for construct the timetable. User of this system which is administrator, lecturer, dean, technician, student especially student direct intake will able to manage their timetable more manageable. User will be able to impose constraints on the schedule to encompass such irregularities such as the time constraint for certain lecturer, the software installed in certain lab and etc. weakness of the current system is not user friendly, and not flexible, wasting time and effort make the current system not more efficient anymore. Using RUP as methodology this system is using AJAX,PHP and MYSQL for client side which web and using Java for RMI.

ABSTRAK

Automated Timetable Scheduling System (ATSS) merupakan satu sistem *online* yang dibangunkan untuk memudahkan pihak pengurusan FTMK untuk menyediakan jadual pembelajaran bagi kegunaan Fakulti FTMK. ATSS menggerakkan sistem penjadualan kepada teknologi terbaru di mana pengurusan jadual menjadi lebih mudah, cepat dan sistematik dengan adanya penjadualan secara automatik berbanding sistem manual yang mengambil masa berminggu-minggu untuk penjadualan jadual waktu. Pengguna system ini ialah admin, pensyarah, dekan, juruteknik dan pelajar khususnya pelajar “direct intake” akan menyusun jadual mereka dengan lebih teratur. Pengguna dapat mengelak daripada kelemahan sistem semasa yang tidak mesra pengguna, tidak fleksible, membazir masa dan tenaga menyebabkan sistem semasa tidak mampu untuk memenuhi kehendak pengguna semasa. Menggunakan metodologi RUP, system ini dibangunkan menggunakan AJAX, PHP dan MYSQL untuk “client side” dan menggunakan bahasa pengaturcaraan JAVA untuk membangunkan RMI.

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER I

INTRODUCTION

1.1 Project Background

Nowadays, Information and Communication Technology (ICT) brings a new technology to change and ease the scheduling management that will give a more systematic and efficient process. Timetable was handled traditionally by using builder's logic where Head Department will assign subjects to the lecturers and the committee will schedule the timetable manually. This process can cause error to the scheduling management and it's a massive task to the committee.

Automated Timetable Scheduling System for FTMK Direct Entry Student will help user to generate the timetable schedule automatically by referring to the subjects' priority, lab capacity, software availability and so on. This system will generate three timetables for lecturers, students, and labs. Admin will manage the schedule scheduling for any required changes in two methods, which are by one-by-one input of lecturer and subject, or by priority. For direct intake student, they will have option to manage their timetable scheduling, process on their where they can choose to have a manually-customized schedule or this system will provide them an auto-generated timetable.

Through this system, developing the services logic that controls the concepts of managing the complexity of scheduling with fully automated scheduling process will improve logistic thinking and skills in decision support system development within artificial intelligent subject. This system will be developed using java

platform provided by SUN Microsystems and the suitable database such as MySQL to store the data in more efficient and safety way.

1.2 Problem Statement

The idea to develop ATSS occurs from the several problems that have been identified from the traditional system where timetable scheduling process was handled manually that require staff having to identified every schedule to make sure there are no redundancy for the class placement at any specific time. This process will be a burden to be managed by the assigned staff and it require a lot of discipline and logistic for checking. Traditional process also affecting some direct entry and student who repeat subjects student. As an example the direct entry student have to manage their own timetable depending to their own timetable depending on the subjects timetable that have been offered for them in that semester.

Function

- User will be able to view the planned schedule in an easily readable format.
- User will be able to provide a seed schedule for modification/completion by the system.
- User will be able to modify the schedule proposed by the system.
- User will be able to impose constraints on the schedule to encompass such irregularities such as the time constraint for certain lecturer, the software installed in certain lab and etc.

Form

- Web-based
- **Simple to use and understand**
 - Basic options presented first
 - Advanced options available
- Variety of constraints
- **Constraints specified at both macro (over-all) and micro (quarter) level.**
- Little user input needed for “basic” schedules.

- Secure
 - Access levels allowing other actors to view schedules that are not their own (for example, an Advisor should be able to view an advisee's schedule)

Economy

- Lightweight Utility
- Inexpensive to develop
- Low hardware requirements

Time

- Able to change requirements for Priority, capacity and description for places
- Able to add new lab, classes
- Able to remove lab, classes

1.3 Objective

The general objective in developing this system is to improve the scheduling management. Below are the lists of the objective of the ATSS

- To provide a powerful tool that can be used for semi-automated scheduling timetable and manage it
- To apply skills such as programming, documentation, design interface and database gained during study in UTeM
- To apply the DSS(decision support system) in generating semi-automated scheduling timetable
- To help direct intake student to arrange their timetable easily and in systematic way.

1.4 Scope

1.4.1 User

The target users for this system are users within FTMK who need to manage their timetable scheduling for teaching or learning objective. Users will be grouped referring to their task and job position.

- i. Dean
- ii. Lecturers
- iii. Students
-especially for Direct Entry Student
- iv. Technician
- v. Admin
- vi. staff

1.4.2 Functionality

The main function in the ATSS is for direct-entry student, they will be given options, whether to build their time schedule suggested by the system, or they can manually manage it by themselves and also to reduce workload of assigned staff to schedule timetable. Head Department will assign task for every lecturers related to their teaching subjects. Then the schedule will be build automatically referring on the task given, software available at the lab, and lab or classroom capacity. If any changes required, changes will be handled manually.

1.5 Project Significance

In order to schedule timetables, a good concentration, discipline, and logistic are required to avoid errors or redundancy. Staffs involved also showing that traditional process is lacking of efficiency and not optimal. This ATSS system is a solution for the traditional process where the manual process will be replaced with an automatic process. With this system, staff will have no worries about class or lab

redundancy at related time. Also, direct intake students will benefits from this system to schedule their timetable. Students can also view their timetable everywhere via internet as this system is built on web-based applications.

1.6 Expected Output

ATSS system will be built using two advances technologies, by using web-based application and also distributed system. In distributed system, Remote Method Invocation (RMI) will be used to schedule the timetables and web application will be used as a platform to preview the result. Timetables scheduling will be built in systematic way and without having any redundancy. Timetables can be previewed on websites or either it can be downloads in Microsoft Excel formatted for personal keeping.

1.7 Conclusion

As the conclusion for this chapter, ATSS can be used as a solution to the problem for complicated timetable scheduling into being a fast-build and efficiency way to solve timetable problems.

The next activity to be carried out is to complete the chapter 2. Chapter 2 consists of fact and finding, project methodology, project requirements and project schedules and milestones. In order to complete this chapter, a lot of effort needs to be done on research about proposed title, including study on related journals, research reports, and articles.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Literature reviews were done based on the surveyed of the previous scheduling timetable business process. The review covered the theory and concepts which will be used in generating automated timetable scheduling. Literature review is showing the research that related to the project topic. The meaning of literature review is a critical look of existing research that significant to the works that are carried out. Literature review is important because it show the target of the project.

This chapter contain all the research that has been done on the previous system and existing system on the internet including reviews on the features, capabilities and so on. All the weaknesses on the current or existing system were identified in order for this project to overcome and the strength of the existing system are identified and studied so that it can be implemented in the system.

The methodology consists of several phases as guidelines that are to be achieved. The project requirements such as software and hardware, for the project development are determined. The project milestone from the start until the delivery phases are also will be brief and list in this chapter. The milestone and Gantt chart is important as a guideline to ensure the project can be finish according to the schedule and plan.

2.2 Fact and Findings

Fact and Finding is a discovery of fact or accurate information. This section conveys about the timetable, analyze the existing system, to find out the strength and weaknesses of the system. After all the strength and weakness has been analyze, it will then been applied to the system and the failure and weaknesses will then been improved. All the fact and finding will be support by a review of the existing system and technique that related used by the others and based on the interview of the end users. Besides that, all the related information can be gathered by using internet and books.

2.2.1 Domain

The Automated Timetable Scheduling System for FTMK direct entry student (ATSS) will be used at FTMK. This system currently used manual business process that can easily lead to problem. The ATSS is important because the timetable is a guideline for the lecturers and students to be used through suit the semester.

As we can see, automated planning and scheduling is within artificial intelligence that regarding the realization of strategies or action sequences, typically for execution by intelligent agents, autonomous robots and unmanned vehicles. Compare with classical control and classification problems, the solutions are complex, unknown and have to be discovered and optimized in multidimensional space. Solutions can be found and evaluated prior to execution. Solutions usually resort to iterative trial and error processes commonly seen in artificial intelligence. These include dynamic programming, reinforcement learning and combinatorial optimization. A typical planner takes three inputs which are the description of the initial state of the world, a description of the desired goal, and a set of possible actions.

The difficulty of planning in building automated scheduling is dependent on the simplifying assumptions of staff such as the atomic time, deterministic time, complete observables, etc. Classical planners make all these assumptions and have been studied most fully. Some popular techniques includes the forward chaining and backward chaining state-space search, possibly enhanced by the use of relationships among conditions or heuristics synthesized from the problem, search through plan space, and translation to propositional probability. If the assumption of determinism is dropped and a probabilistic model of uncertainty is adopted, then this leads to the problem of policy generation for a Markov decision process (MDP) or (in the general case) partially observable Markov decision process (POMDP).

This project can increase the efficiency of cost besides allowing the easier way to produce timetable.

2.2.2 Existing Systems

i) Conventional systems

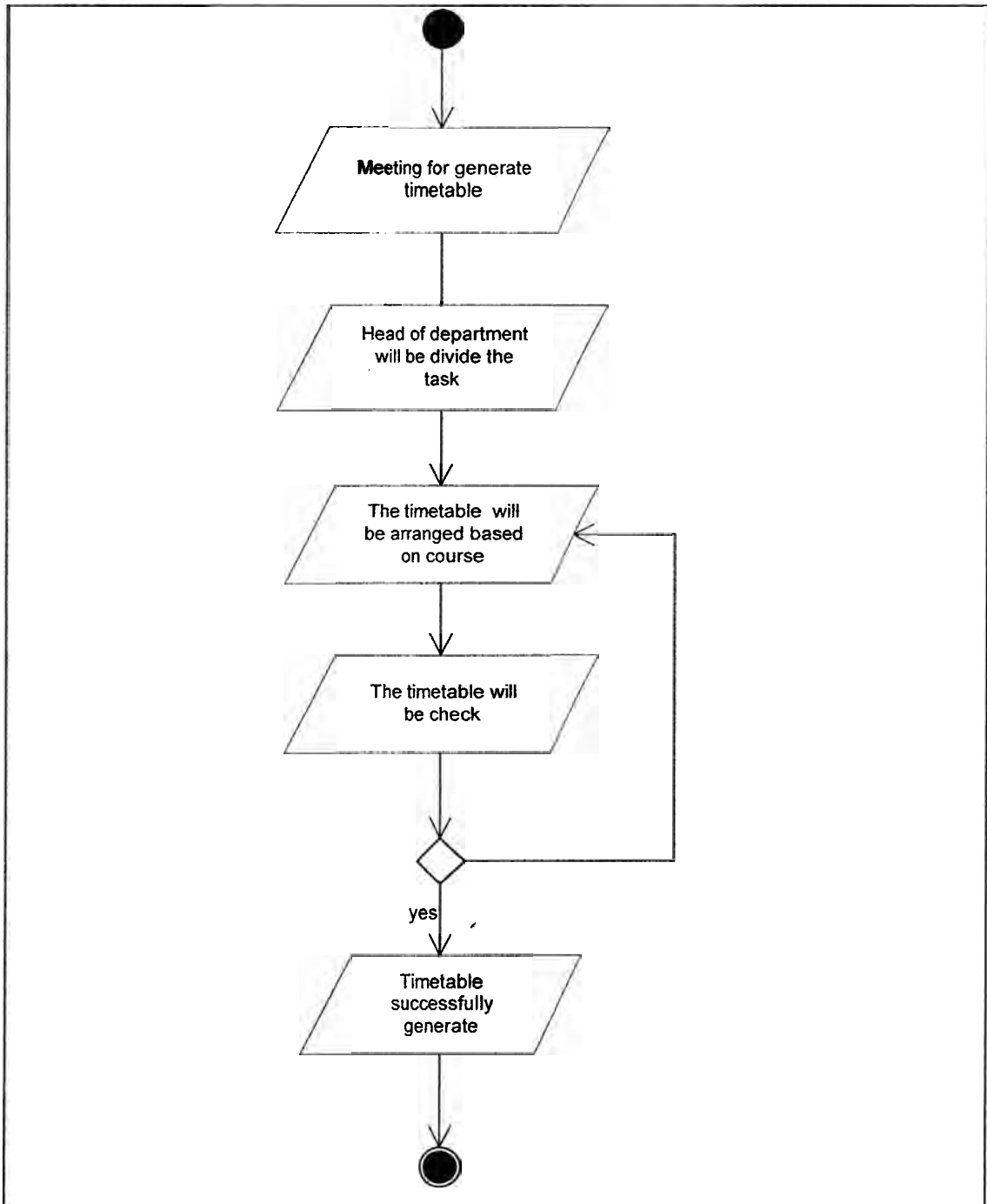


Figure 2.1: Conventional System

FTMK currently used manual business process to build the timetable. The FTMK team will attend a meeting than Head of Department will be dividing the task. The staff will be arranging the timetable based on course. Finally, the entire timetable will be check again to avoid redundant. The output of this process is three

timetable, which is lecturer timetable, class timetable and lab timetable. This process would lead to several problems to the scheduling management and it's a massive task to the committee. The business process applied to this system needed many manual process flows during scheduling the timetable.

Some of the problems were related to human mistakes that can cause to timetable redundancy during manually scheduling the timetables. Since the timetables were written on paper, this process can caused to several missing important data if it was not properly kept.