

# Advisory Aided System To Institute of Higher Learning (AASTIH) based on Rule-based & Personality Assessment

<sup>1</sup>Mohd. Azam Osman, Maziani bt Sabudin, Shaiful Hisham Shaharuddin

School of Computer Sciences  
Universiti Sains Malaysia  
11800 Penang, Malaysia  
{[azam.maziani@cs.usm.my](mailto:azam.maziani@cs.usm.my), [shaiful.hisham@yahoo.com](mailto:shaiful.hisham@yahoo.com)}

## Abstract

This paper discuss about the implementation and method used in AASTIH. AISTIH is a web-based database system that uses rule-based and personality assessment in assisting student to apply the suitable course in institute of higher learning in Malaysia. It is a system designed with one thing in mind: to guide and advice students in selecting the courses tailored to their interests and qualifications based on students' academic qualifications and interests, using the rule-based approach in Artificial Intelligence

**Keywords:** advisory system, rule-based, personality assessment

## 1. Introduction

This system is targeted for three different types of user: students, university and system administrator. For each type of user, the system will limit the usage and functions depending on the types of the user. AASTIH provides suggestions for students regarding courses which are suitable for them depending on their interest as well as their academic qualification. Personality tests are designed especially to aid students in choosing their courses. The questions prepared are high-level and bilingual consisting of English and Bahasa Malaysia.

AASTIH also functions as an information-providing system to help students gain information such as the minimum requirements of each course and give guidance to students in checking their pointers. This is to ensure that they have met the requirements for each of the courses that they intend to apply. Previously, such problems arise when students were unable to enroll in their preferred choice of course

due to misinformation on the course requirement details.

AAISTIH also benefits the university staff as it enables them to update the information for all the different faculties in each university with relative simplicity. This will indefinitely provide the latest and valid information for students at all times. Furthermore, the system will be able to generate graphical reports for the university staff to be used as a prediction and forecasting tool to determine the number of courses offered for each semester or year. By doing so, the university staff will save immense amount of time and workload. Administrators are able to create or delete university accounts and are involve in setting the questionnaires in the personality test. Analysis reports in diagrammatic form are also available. Pie charts, bar and line graphs depict survey results on the popularity of each course in each university. These reports provide further assistance for example, in deciding whether to disband a course or add new courses to the current crop of courses offered in the university.

This paper will discuss the process of identifying and analyzing student's personality, course requirements, student's qualification and the suitability of courses. AASTIH uses the rule-based approach which can adapt to several numbers of problems. As a whole, AASTIH manages the workload of a large number of people from different perspectives and reduces the building stress among students during the course selection process.

## 2. Motivation

Time is gold. AASTIH saves time as every task is fully automated. The generated reports are complete, simple, and easy to view to minutest of details.

Subsequently, students tend to be one-sided when it comes to making decisions. For instance, they would prefer to follow in the footsteps of friends or just simply accept parents' decisions in decision-making situations. They do not have the initiative to be professional by learning to think for themselves. For this reason, AAISTIH offers professional help via personality tests designed to enable students to express their own personalities. The bottom line is, AAISTIH will reap in huge loads of profits and be beneficial to the educational society.

The primary focus of AAISTIH is at students furthering their studies in local educational institutions. At the moment, the usage of AAISTIH is only limited to Malaysian students. Our mission and vision is for this system to break the international barrier and provide for students in major educational cities around the world such as London and Boston, Massachusetts. AAISTIH has yet to hit the streets but it could possibly be the answer to dilemmas such as "What do I want to do in future?" and "What course suits me best?"

### 3. Approach and Methodology

To develop the system, we used a Parallel Development-based Methodology that consists of several phases, planning, analysis, design, implementation and intergration [2]. The reason for choosing the Parallel Development Methodology is due to the nature of AAISTIH system development that involves a team work and each module is developed separately. The choosen methodology make ease of each team member to intergrate the seperated modules to be a complete system. AAISTIH uses VBScript in Microsoft Visual Studio 2003 .NET as its programming language and Microsoft SQL Server as its database anchor head and also incorporates the Ajax technology and a branch of Artificial Intelligence known as the rule-based approach to offer intelligence in predicting the suitable course for each student [6]. Other secondary software used includes the Adobe Photoshop CS2 and Macromedia Flash MX Professional.

This system uses a branch of Artificial Intelligence, commonly known as the rule-based (expert) approach to predict the best suitable course for each student by analyzing the various students' responses in the personality test [3]. AAISTIH takes the best of both worlds by combining corporate database and

Artificial Intelligence technologies in performing the required functions. To determine a student personality we use Self Directed Search by John L. Holland [1]. The reason we choose its method is due to brief description on the category and easier to determine the courses are in what category. The Microsoft Visual Studio NET and the Microsoft SQL Server are the building blocks of AAISTIH and they are chosen because for a lot of reasons. .NET was used because it is stable and it contains a build-in-controller as well as 'intelligence' and code-behind technologies while the SQL Server heads our list of other world renowned database management systems because of it supports client-based script, implements server-based technology, and has a customized controller among other features.

### 4. Implementation

There are few steps involve in the process of advisory to students. The steps are as shown in figure 1. AAISTIH system requires several inputs from various users. There are pra university student (after matriculation or STPM), minimum entry qualification for each course offered from the university and cut of entering point for the appropriate courses. Students are required to fill up the SPM result, MUET and Matriculation results or STPM results. Then, students should answer the personality test for identifying their career suitability. Later students will choose the university and their desire course offered. Based on the available information, the calculation of suitability for students according the students personality and their academic qualification will be computed. The rule-based (expert) approach is used to predict the best suitable course for each student by analyzing the various students' responses in the personality test [4]. AAISTIH takes the best of both worlds by combining corporate database and Artificial Intelligence technologies in performing the required functions.

As mention above, the prediction is based on several parameters to forecast the possibility of success for students to get the applied course. There are three possibilities to indicate the chances for students to get the course that are high, average and low. AAISTIH system will base on two academic years of cut off entering points for each course entered by university staff yearly and later compared with student's qualification (CGPA) and the result of personality test. The following explanation will be discussing on how find the forecast point of cut of entering point for

the next t academic year for each course. Firstly we find the average of cut entering point for entering the appropriate course for last two of academic years, called AveC. Then we get the difference between cut of entering point for the last two academic years and divided by three, called DiffP. To obtain the forecast point of cut of entering point (A) of high possibility chances is  $A = AveC + DiffP$  and to obtain the low possibility is  $B = AveC - DiffP$ . So that student who has CGPA equal or above value of A and the course applied is matched with their personality test, the AAISTIH system will give the result as high. If student's CGPA is lower the B, the AAISTIH system will give the result as low. While if student's CGPA is between the values of A and B, the AAISTIH system will give the result as medium. In addition, The AAISTIH system also has capability to suggest the appropriate course and university to student if the forecasting result is medium or low to student based on student's data [7].

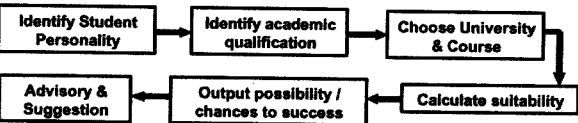


Figure: 1

### 5. Result

The diagram in figure 2 shows a main page of the AAISTIH system

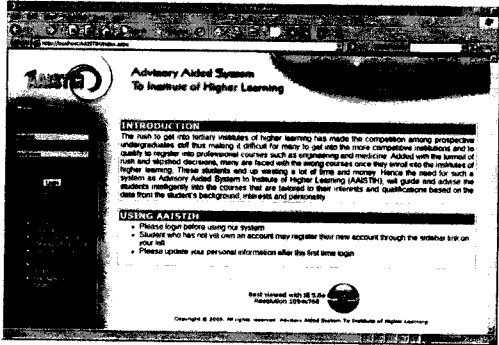


Figure 2

The diagram in figure 3 and 4 shown the students' page where they fill up their personal information and academic qualification

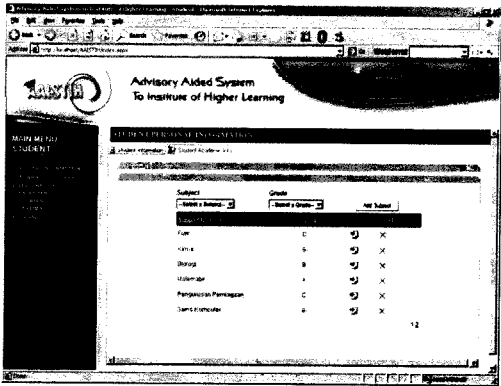


Figure 3

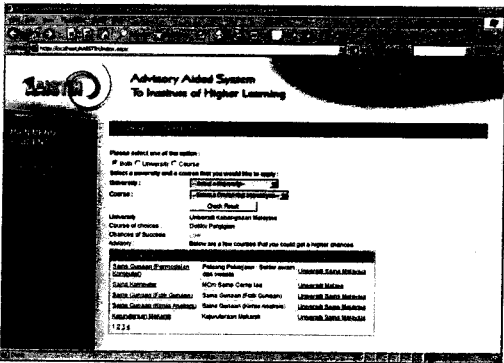


Figure 4

The diagrams in the following figures (figure 5 and figure 6) show the sample of the generated reports from AAISTIH system for the university

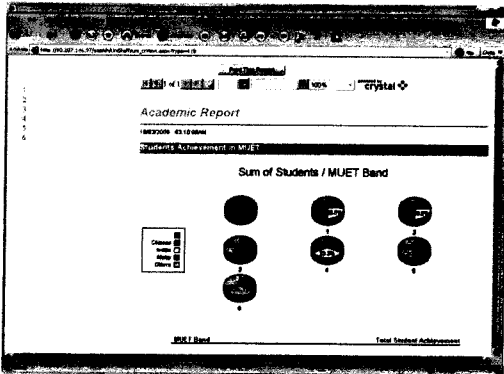


Figure 5

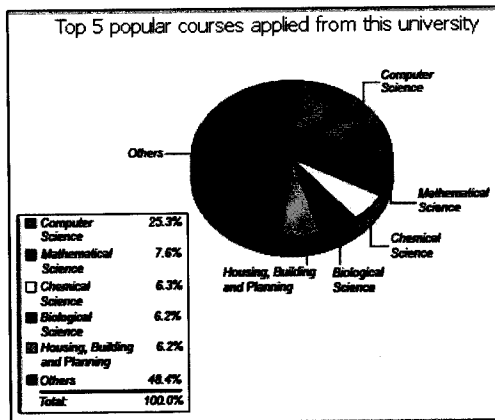


Figure 6

## 6. Conclusion

The end result using of AAISTIH will be undeniably positive. Tasks have been carried out from various universities about career guidance and the results were excellent. The problem which occur might be the hassle for students to submit surveys as well as to wait for the results on what field they are suitable in. At the same time, universities staff will have to check sheets and sheets of survey forms. This might take days or even weeks. This is where AAISTIH comes in. As the Internet is so widely used, web-based systems are fast becoming a common sight among users.

AAISTIH is a non-profit system, and is 100% developed in Malaysia, in University of Science aimed at local universities and providing students and staff alike with unlimited information on course requirements, generating statistical and analytical reports, and perhaps help predict future employment.

## References

- [1] Thomas Connolly & Corolyn Begg, Pearson Addison Wesley (2004). Database Solution: A Step by step guide to building database Second Edition.
- [2] Alan Dennis & Barbara Haley, Wiley International (2005). System Analysis And Design With UML Version 2.0 : An Object Oriented Approach Second Edition.
- [3] Hendrix, T. D., Cross, J. H. II and Maghsoodloo, S. (2002). The Effectiveness of Control Structure Diagrams in Code Comprehension Activities. *IEEE Transactions on Software Engineering*. 28(5): 463-477.
- [4] Oman, P. W. and Cook, C. R. (1990). The Book Paradigm for Improved Maintenance. *IEEE Software*. 7(1): 39-45.
- [5] Shaffer, C. A. (1997). *A Practical Introduction to Data Structures and Algorithm Analysis*. New Jersey: Prentice-Hall.
- [6] Sulaiman, S., Idris, N. B. and Sahibuddin, S. (2002). Production and Maintenance of System Documentation: What, Why, When and How Tools Should Support the Practice. *Proceedings of 9<sup>th</sup> Asia Pacific Software Engineering Conference (APSEC 2002)*. USA: IEEE Computer Society Press. 558-567. Information Literacy Group, Leeds University Library (2005).
- [7] *Harvard Style Bibliographies and References*. Available from: <http://www.leeds.ac.uk/library/training/referencing/harvard.htm>. [Accessed 2 Aug. 2005]