

Design and Development of a Search Portal for Private Higher Education Institutions in Malaysia

Nurul Aziana¹, Intan Syazwani², Syahrul Fahmy^{3*}

¹ Faculty of Computer, Media and Technology Management, University College TATI, Malaysia

² Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, Malaysia

³ Big Data Institute, University College TATI, Malaysia

*Corresponding author: fahmy@uctati.edu.my

KEYWORDS	ABSTRACT
Higher Learning Institution Rapid Prototyping Search Portal Software Construction Software Engineering	<p>The number of candidates sitting for the Sijil Pelajaran Malaysia and Sijil Tinggi Pelajaran Malaysia has been around the 400,000 and 40,000 marks for the last 3 years. Although more than 50% of these candidates are eligible to pursue higher education at Higher Education Institutions (HEIs) in Malaysia once the exam results are announced, only a fraction is offered place to study. The issue of HEI dropouts are serious and several government agencies have organized special initiatives to ensure more eligible candidates are accepted into HEIs. Looking from the computing perspective, applications to public HEIs is carried out through the UPU Online portal. However, there is no similar system for searching private HEIs. In order to support the government's initiative and to minimize dropout rates to HEIs, MyIPTS, a search portal for private HEIs in Malaysia was developed. MyIPTS would facilitate HEI search by name and program offered. Results, detailing HEI name, location, program name, education level, accreditation status and link to the HEI's official website are presented. MyIPTS database is populated with details of all HEIs registered with the MOE, details of academic programs offered by individual HEIs, and list of accredited academic programs for individual HEIs, obtained from the MQA. A traditional rapid prototyping approach for system development was adopted in the design and development of MyIPTS. Development tools used Android Studio and Adobe Dreamweaver for interface design; and php and HTML as scripting languages, and MySQL as the database. The portal was tested by a group of 60 users to confirm its functionality and ease of use. Responses were quantified using a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Highly Agree). Initial results are encouraging with average scores of 4.7 and 4.8 were recorded for functionality and ease of use were respectively.</p>

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1.0 INTRODUCTION

The number of candidates sitting for the Sijil Pelajaran Malaysia (SPM) and Sijil Tinggi Pelajaran Malaysia (STPM) has been around the 400,000 and 40,000 marks for the last 3 years. The number of SPM candidates has increased from 434,535 in 2016 (mStar, 2017), 443,883 in 2017 (mStar, 2018) to 421,706 in 2018 (Berita Harian, 2019a); whilst STPM candidates recorded a decrease from 43,325 in 2016 (GPS Bestari), 45,303 in 2017 (Berita Harian, 2017) to 42,849 in 2018 (Kementerian Pendidikan Malaysia, 2019a).

Although more than 50% of these candidates are eligible to pursue higher education at *Higher Education Institutions* (HEIs) in Malaysia once the exam results are announced, only a fraction is offered place to study. For example, only 182,409 SPM candidates were offered place at public HEIs in 2018 (Berita Harian, 2018). Although the number has increased from 2017 (Kementerian Pendidikan Malaysia, 2016), more and more eligible candidates have slipped through the system (dropout) and not been able to pursue studies at local HEIs. The issue of HEI dropouts are serious and several government agencies have organized special initiatives to ensure more eligible candidates are accepted into HEIs for example programs by the Terengganu State government (Teganukita, 2019) and PTPTN (Berita Harian, 2019b).

Looking from the *computing* perspective, applications to public HEIs is carried out through the *UPU Online* portal, which is under the purview of the *Ministry of Education* (MoE). However, there is no similar system for searching private HEIs. In order to support the government’s initiative and to minimize dropout rates to HEIs, we propose **MyIPTS**, a search portal for private HEIs in Malaysia.

The initial idea of MyIPTS was presented at the national *Research and Innovation Week* in 2020 where it was awarded the gold medal (Aziana et al., 2020). This paper extends the idea to a working prototype of the portal and reports the works of a computing undergraduate project at University College TATI under the *Software Engineering Research Group*. The group is dedicated to the development of computer applications to address real-life issues. Examples of past projects include a new tourism workforce through ICT (Fahmy et al., 2020) and an App to check the status of Islamic preacher in Malaysia (Fahmy et al., 2019).

This paper is organized as follows: section 2.0 presents the overall framework of MyIPTS; section 3.0 presents its design and development; section 4.0 presents results of system testing; and section 5.0 presents the conclusion of the project.

2.0 OVERALL FRAMEWORK

The overall framework for MYIPTS is illustrated in Figure 1.

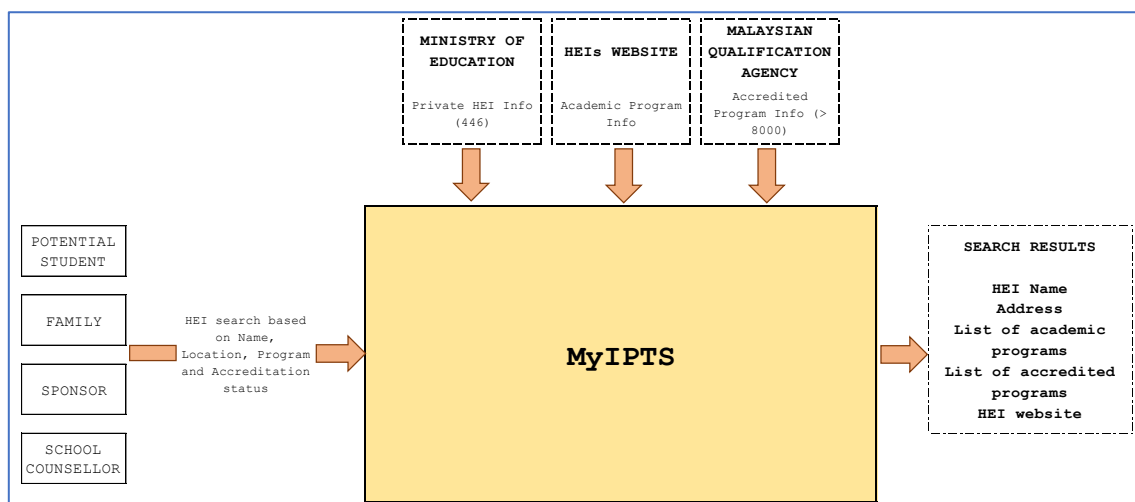


Figure 1: MyIPTS Framework

MyIPTS would facilitate four types of users in searching private HEIs namely potential students, their family members, sponsors and high school counsellors. Data will be obtained from two major sources namely the MOE and the *Malaysian Qualification Agency* (MQA). Search results is a list of HEIs that fulfil the search criteria including HEI Name, Location/ State, Program (Foundation/ Diploma/ Bachelor) and accreditation status.

The MQA maintains a national register known as the Malaysian Qualifications Register, containing programmes, qualifications and HEIs accredited under the Malaysian Qualifications Agency Act 2007. The MQR is the reference point for accredited programmes awarded by HEIs. These programmes or qualifications must conform to the Malaysian Qualifications Framework.

MyIPTS will be populated with details of all HEIs registered with the MOE which is 446 as of December 2019 (Kementerian Pendidikan Malaysia, 2019b); details of academic programs offered by individual HEIs, obtained from their official website; and list of accredited academic programs for individual HEIs, obtained from the MQA. As of December 2019, the number of accredited programs for HEIs is more 8,000 (Daftar Kelayakan Malaysia, 2020).

3.0 DESIGN AND DEVELOPMENT

A traditional *rapid prototyping* approach for system development (Chua et al., 2010) was adopted in the design and development of MyIPTS. Development tools used *Android Studio* and *Adobe Dreamweaver* for interface design; and *php* and *HTML* as scripting languages, and *MySQL* as the database. The UPU Online website was thoroughly examined as it is closest system to MyIPTS (Figure 2).

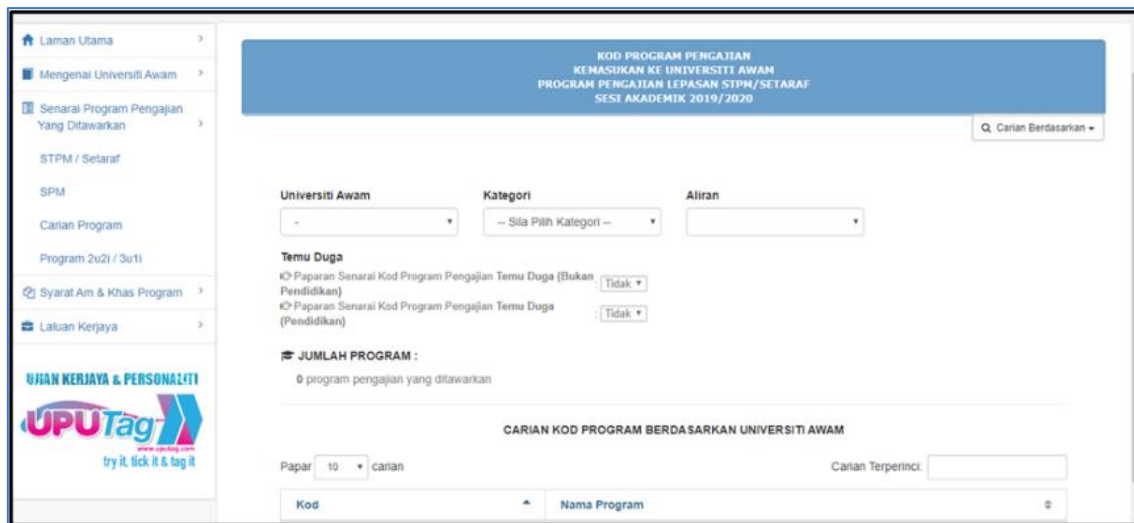


Figure 2: UPU Online

UPU Online implements and monitors policies to enhance the learning environment for SPM and STPM programs. It processes and coordinates student admission to public HEIs including Polytechnic, Community Colleges, and university. The interface and search criteria were adapted in MyIPTS to ensure seamless transition from public HEIs search to private HEIs.

Figure 3 illustrates the flowchart for MyIPTS where users are offered the options of searching HEI(s) based on name, state, course offered, and accreditation status while Figure 4 illustrates the data flow diagram of the portal.

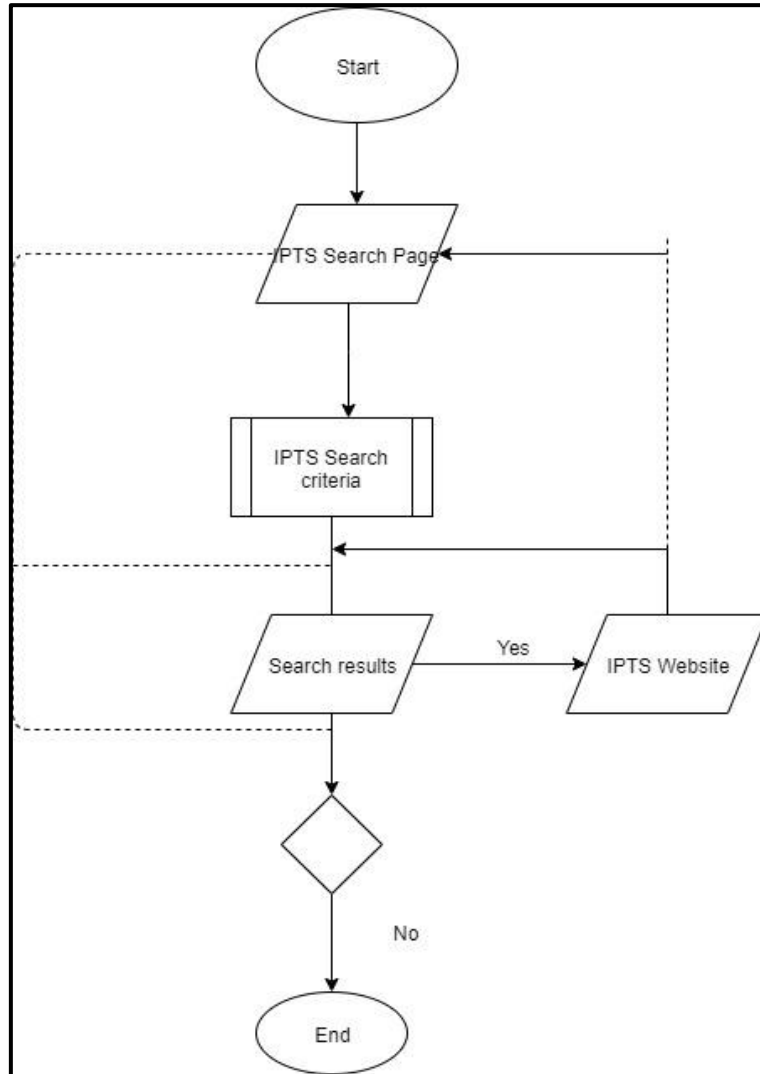


Figure 3: MyIPTS Flowchart

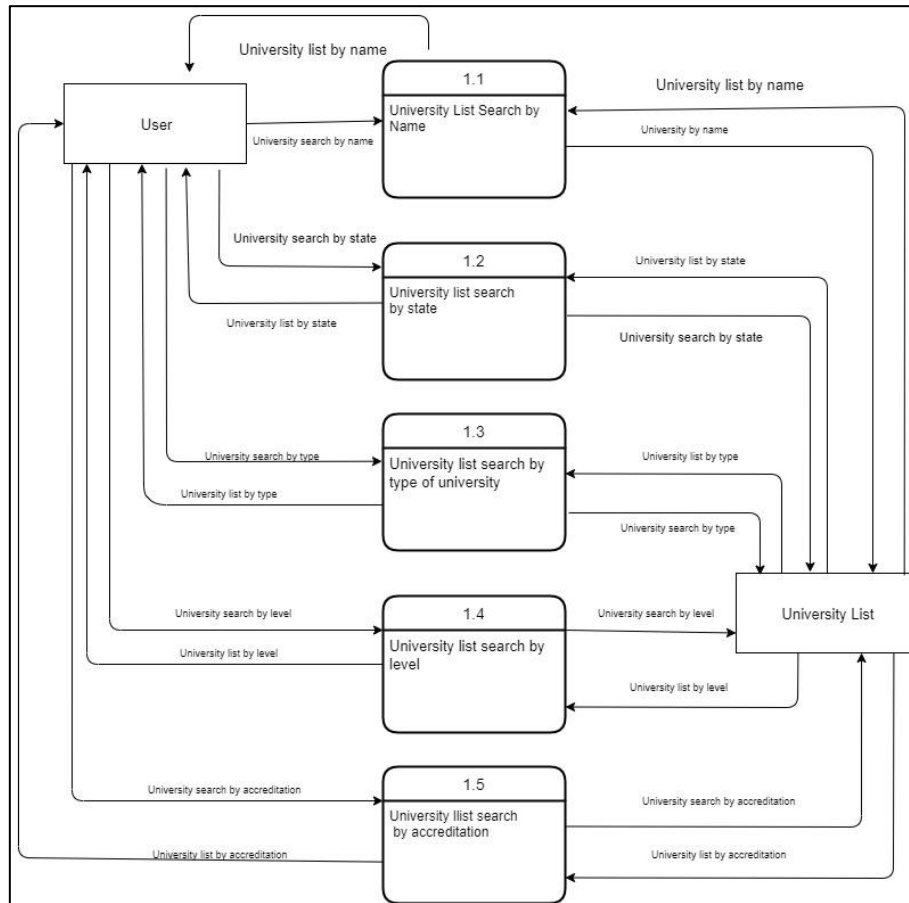


Figure 4: MyIPTS Data Flow Diagram

Figure 5 illustrates the *entity-relationship diagram* for MyIPTS, listing its main tables including *Program*, *IPT*, *State*, and *Accreditation Status*.

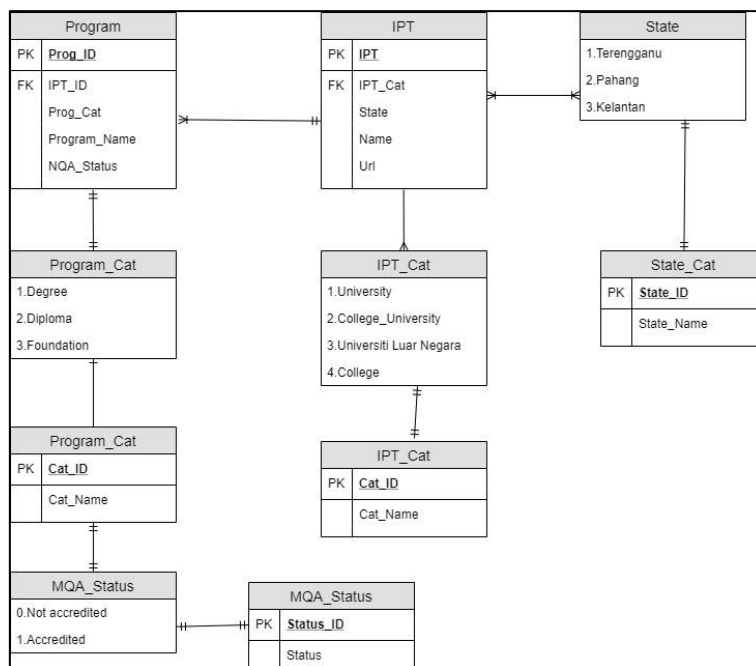


Figure 5: MyIPTS ER Diagram

Figure 6 illustrates login page to MyIPTS which is username and password protected.



Figure 6: MyIPTS Login Page

Upon successful authentication, users are directed to the search page. Users can search by HEI (Figure 7) or by academic programs (Figure 8).

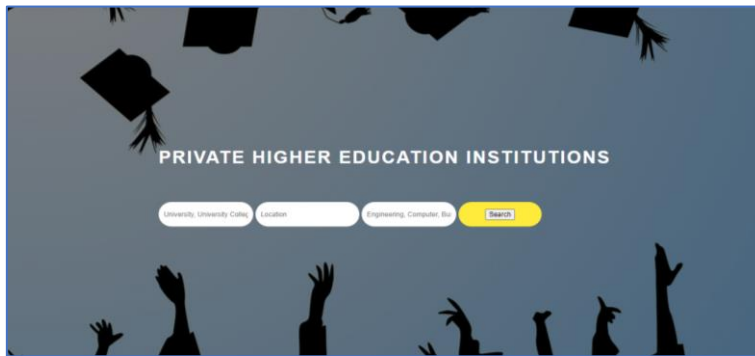


Figure 7: MyIPTS Search by HEI Page

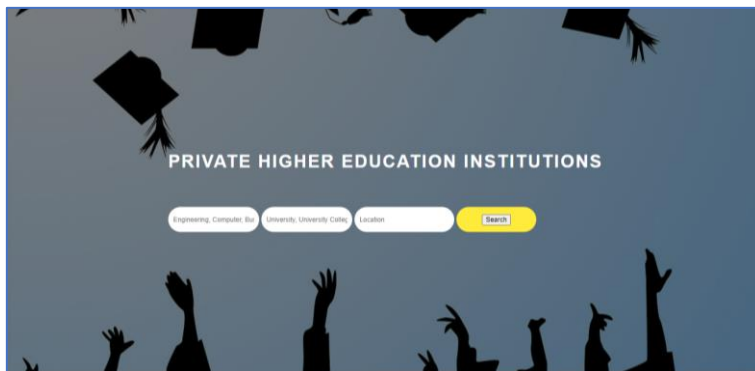


Figure 8: MyIPTS Search by Program Page

Results, detailing HEI name, location, program name, education level, accreditation status and link to its official website are then presented to the user (Figure 9).

COLLEGE	LOCATION	COURSE	LEVEL	MQA	PAUTAN
UNIVERSITI COLLEGE TATI	TERENGGANU	COMPUTER SCIENCE	DEGREE	YES	https://www.tatiuc.edu.my/
University College Tati	Terengganu	Information Technology	Diploma	Yes	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	CHEMICAL ENGINEERING TECHNOLOGY (HONOURS)	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	COMPUTER SCIENCE (COMPUTER NETWORK AND SECURITY) WITH HONOURS	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	INFORMATION TECHNOLOGY WITH BUSINESS MANAGEMENT(HONOURS)	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	DIGITAL GRAPHIC DESIGN (HONOURS)	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	ENGINEERING TECHNOLOGY (HONOURS) ELECTRICAL	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	ENGINEERING TECHNOLOGY (HONOURS) MECHATRONICS	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	MANUFACTURING ENGINEERING TECHNOLOGY (PRODUCTION MANAGEMENT) WITH HONOURS	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	MANUFACTURING ENGINEERING TECHNOLOGY (TOOLING) WITH HONOURS	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	10) BACHELOR OF POLYMER ENGINEERING TECHNOLOGY (HONOURS)	BACHELOR	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	CHEMICAL ENGINEERING TECHNOLOGY	DIPLOMA	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	COMPUTER NETWORKING	DIPLOMA	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	GRAPHIC DESIGN & CREATIVE MEDIA	DIPLOMA	YES	https://www.tatiuc.edu.my/
UNIVERSITY COLLEGE TATI	TERENGGANU	INDUSTRIAL AUTOMATION (ELECTRICAL)	DIPLOMA	YES	https://www.tatiuc.edu.my/

Figure 9: MyIPTS Result Page

4.0 TESTING

The portal was tested by a group of 40 students and 10 lecturers from University College TATI in addition to 30 parents of prospective students to confirm its functionality. Each respondent was given access to the portal from May to August 2020. Links to list of HEIs and details of accredited program by the MQA was also given to the respondents for cross-checking purposes.

Minor issues were reported during the first two weeks concerning page re-directions and were successfully fixed by Week 3. No other issues reported until the end of July. In early August, each respondent was given a short survey regarding the portal's functionality and ease of use. Responses were quantified using a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Highly Agree). Average scores for functionality and ease of use were 4.7 and 4.8 respectively.

5.0 CONCLUSION

This project started off with the idea of a search portal for private higher education institutions in Malaysia, complementing its public counterpart. A comprehensive database of Malaysian private HEIs has been designed and developed, facilitating not only potential students but also family members, sponsors and school counsellors. It is hoped that MyIPTS contribute to a more systematic and informed decision making for school leaver in pursuing their tertiary education.

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