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MYDEGS SUPERVISOR SELECTION SYSTEM: TOWARDS PROMOTING EXPERTISE OF THESE SUPERVISORS IN MALAYSIA HIGHER EDUCATION INSTITUTIONS TO GLOBAL AUDIENCE

Shahizan Hassan¹

School of Business Management, Universiti Utara Malaysia

Norshuhada Shiratuddin

School Multimedia Technology and Communication, Universiti Utara Malaysia

¹*Corresponding author: shahizan@uum.edu.my*

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ABSTRACT

Applicants for post-graduate research studies find it difficult to identify potential supervisors before applying for admission. This is because there is no single point at which they can browse for that information. In order to address this practical gap in post graduate education and communication management, this study proposed a one-stop-centre called MYDEGS Supervisor Selection System, as a platform for applicants to identify suitable supervisors who meet the criteria in terms of research field and expertise they desire before applying for admission into the Malaysian Higher Education institution. This project was initiated by the Graduate Dean's Council of Malaysia (MYDEGS). The data gathering for system and data requirements were performed by two researchers, who were also members of MYDEGS, during several MYDEGS meetings. Twenty public universities were involved in supplying the data of 2000 experts in the country. The completed system was tested by potential users from all participating universities. It was found that the system was fully functional and its objective of assisting prospective Ph.D candidates in identifying potential supervisors was achieved. Emerging issues and the way forward are discussed.

Keywords: Thesis supervision, thesis supervisor selection, supervisor selection system, research supervision, Malaysia research expertise

INTRODUCTION

Choosing the right supervisor is important for all prospective research students. The supervisor is a faculty member who will be the Mentor of students in their research. Many prospective graduate researchers expect them to be able to identify potential supervisors before applying for admission. Once identified, they can communicate with the potential supervisors to seek advice pertaining to the research idea and topics to be explored prior to admission.

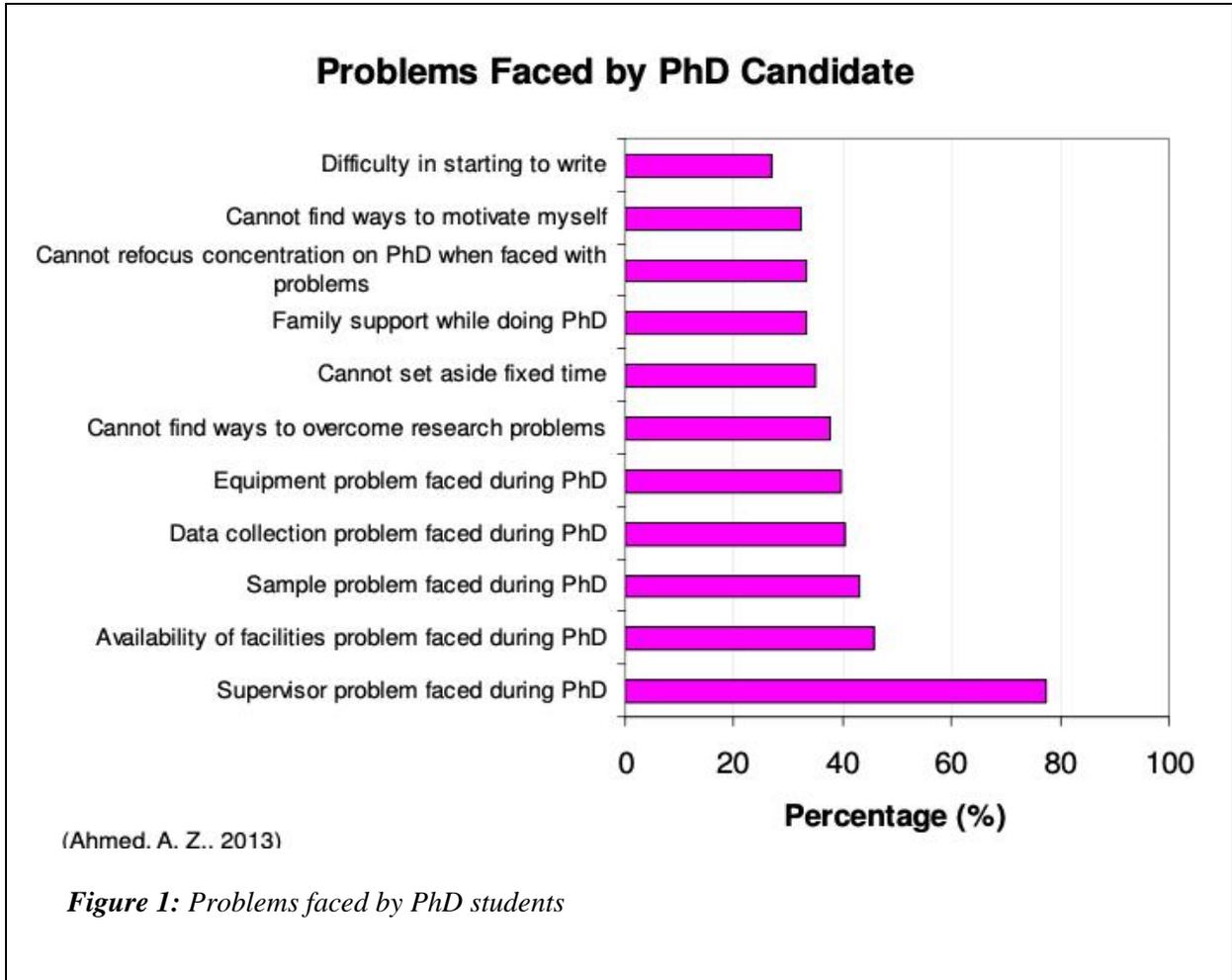
The role of the supervisors in ensuring the success of graduate students is inarguably important (Jabre *et al.*, 2021). The relationship between students and supervisors is very significant in providing a perfect research experience. Most universities provide a list of members or potential faculty supervisors and their research interests on their respective websites. However, the selection through the university's website does not open up the opportunity for applicants to dive into the candidates of supervisors from the same field from different institutions. Applicants are not provided with a one-stop center to enable the selection of fields and proposed names of supervisors from different institutions within the country. In order to address this practical gap in post graduate education and communication management, Deans council of graduate schools in Malaysia (MYDEGS) proposed a one-stop-center database of supervisors to be provided to assist prospective students from within and outside the country to assist them in selecting suitable institutions and field supervisors. Additionally, the system can also serve as a platform to promote the expertise that exist in Malaysia Higher Learning Institutes.

Purpose of Study

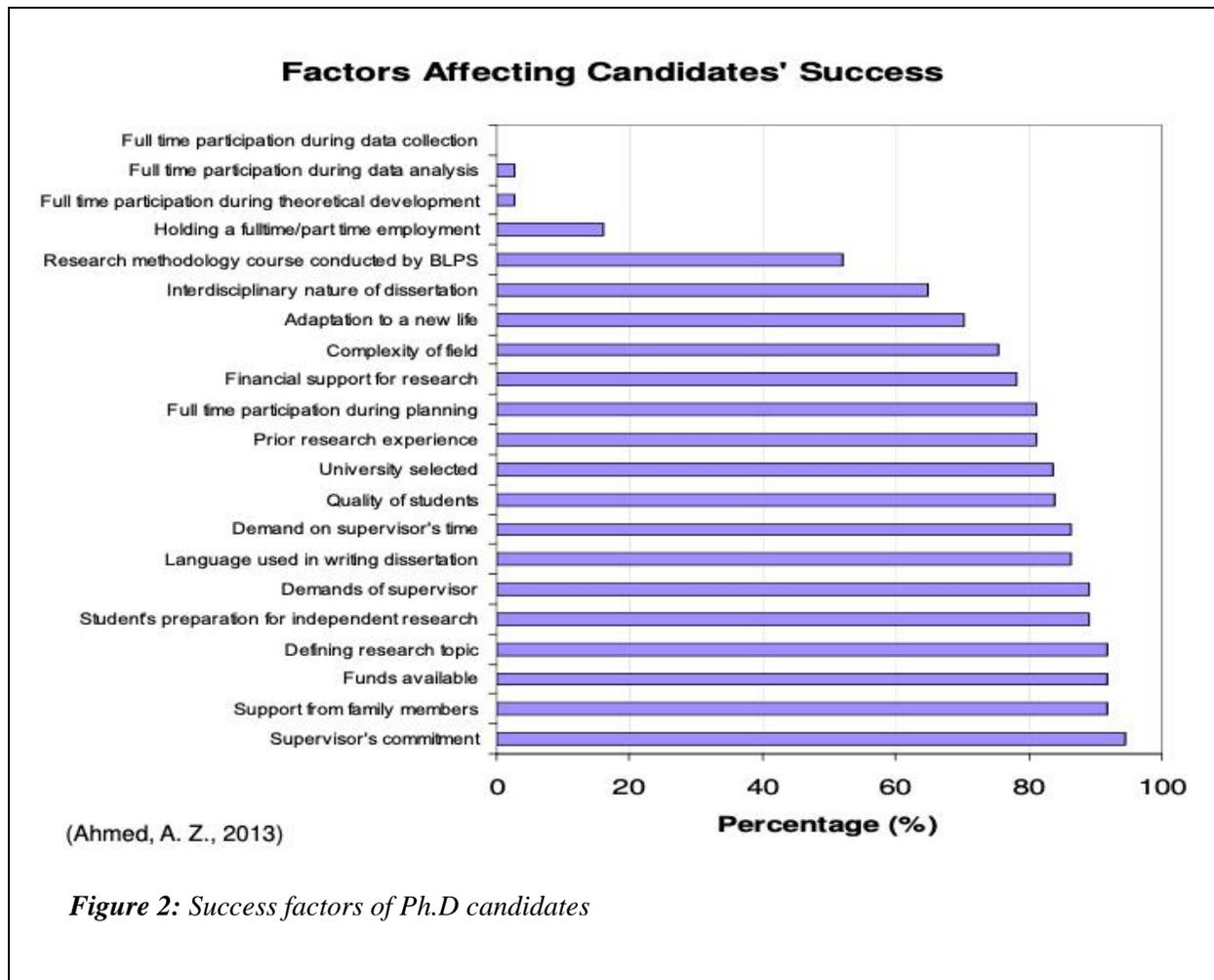
This study developed a web-based one-stop-centre called MYDEGS Supervisor Selection System as a platform for potential applicants to identify and find suitable theses supervisors who meet the criteria in terms of research field and expertise they desire before applying for admission into the Malaysian Higher Education institution. The study was carried out as it can contribute toward the development of post graduate education in Malaysia especially to the participating Higher Institutions in the sense that they can promote the expertise that they have to the outside world. Additionally, it would benefit the general public in Malaysia and abroad who intend to pursue Ph.D Studies in this region. Apart from that, the one-stop-center for theses supervision selection is very useful as it compiles all the relevant data about experts in the participating Higher Education Institutions.

LITERATURE REVIEW

Ahmed's study (2013) mentioned in Suhaimi (2017) lists that most of the problems that Ph.D students face and the main factors that impact their success (refer to fig. 1 and 2) are the relationship and commitment of the supervisor (Killeya, 2008). The issue of the selection of supervisors is a key issue in ensuring the success of their research (Pitchforth et al., 2012; Azah et al., 2012; Dominic, 2016).



Source: Ahmed as cited in Suhaimi (2017)



Source: Ahmed as cited in Suhaimi (2017)

Since the importance of the selection of a suitable supervisor needs to be emphasized, there have been many overseas institutions that provide databases to provide opportunities for Ph.D study applicants to get to know prospective supervisors through their respective research projects. University of Harvard, University of Otago, McGill University, University of British Columbia, University of Copenhagen, University of Surrey and University of Hong Kong are among the examples that provide this kind of platform and database. Most of these universities notably University of Hong Kong (see the HKU Scholars' Hub at <https://hub.hku.hk>) provide potential PhD candidates with a database of experts which can be searched based field of expertise, research projects undertaken, awards received and supervised theses. The only setback is that these Web database systems are only provided for their respective university purposes, meaning that potential students can only browse for researchers who are working in that particular university, not throughout the country.

The Need for Theses Supervisory Database System

Generally, all public universities in Malaysia require a database system that can provide complete information about postgraduate research supervisors at their respective universities. Information such as the number and list of supervisors who can supervise the thesis according to the field of study offered, the

number and list of supervisors who have had students who have exceeded the supervisory quota, and the number and list of supervisors by rank, can help streamline the administrative process of the postgraduate study program.

There are a number of public universities that have developed such system but it is only for internal use. At the time of writing, there is no initiative at the national level to build a comprehensive and centralised database system that can be used by all universities for the purpose of selecting supervisors and these examiners. Previously there was a project developed by Universiti Kebangsaan Malaysia which was the “Malim Sarjana” system which holds information about all researchers in public universities of Malaysia. The system had already been discontinued due to information that has not been updated and there was no maintenance.

Much can be learned from the weaknesses of the Malim Sarjana system. Among them is that the system does not display accurate and up-to-date information. Such system should have accurate, up-to-date information and be constantly updated. Such system also requires data administrators to manage data related to researchers at their respective universities to ensure the accuracy and authenticity of the data stored. Nevertheless, this system is the best example of the initiative to collect research information in all public universities.

From the perspective of postgraduate students or candidates applying for postgraduate studies in the form of research, they urgently need a database system that can display a list of potential supervisors at all public universities that can supervise them in the chosen field of study. Information such as the supervisors’ research field, research experience, and the number of students who have been and are being supervised are very helpful for them to choose a university and nominate their respective thesis supervisors. Research have shown that the matching of the right supervisor and doctoral students is imperative in determining the success of a doctoral project (Polkinghorne *et al.*, 2023). Hence, providing information on supervisors as mentioned above allows doctoral or specifically Ph.D candidates to make informed decisions.

The post-graduate management of public universities often have trouble finding thesis examiners, especially external examiners who fit the thesis because there is no special database that can provide information on potential examiners throughout public universities. All that can be done is to rely only on the data of previously appointed examiners. As a result, only the same examiner is appointed to examine the thesis.

Based on this problem, there is an urgent need for the development of a database system that stores the information of researchers and supervisors in all public universities. This also serve as an example of an initiative that can promote the expertise of researchers in Malaysia.

METHODOLOGY

This study was implemented based on action research whereby the system and user requirements' data were gathered during a series of MYDEGS meetings, of which two researchers were MYDEGS members. In addition, the data was also collected through informal communications with and among MYDEGS members (Deans of graduate schools in Malaysia) via WHATSAPP application.

After completing the system and user requirements phases, a database system was developed. Recommendations from the system to the Ph.D applicants were shortlisted according to the research performance of the prospective supervisor/s. The system provides facilities for students to know the suitability of their research projects according to the supervisors' field of research, publication ability, and number of current supervisees.

Generally, the study adopted the method of study of Design Science (DS). DS is important in disciplines oriented to the successful creation of artifacts. Several researchers have pioneered DS research in information systems. The Design Science Research Methodology (DSRM) used here combines the principles, practices and procedures necessary to conduct such research and meets three objectives: it is consistent with the previous literature, it provides a nominal process model for conducting DS research, and it provides a mental model for presenting and evaluating DS research in IS. The DS process includes six steps: problem identification and motivation, objective definition for solution, design and development, demonstration, evaluation and communication.

Step 1: Problem identification and motivation

As mentioned in earlier section, this project was initiated by MYDEGS which has identified that there is a need for a one-stop-center database of supervisors to assist prospective Ph.D students from within and outside the country in selecting suitable institutions and field supervisors. MYDEGS also believed that the proposed system can also serve as a platform to promote the expertise that exists in Malaysia Higher Learning Institutes.

Step 2: Objective definition for solution

The main objective of the study is to propose a web-based information system called MYDEGS Supervisor Selection System, as a platform for potential Ph.D applicants to identify and find suitable supervisors who meet the criteria in terms of research field and expertise before applying for admission into any of the Malaysian Higher Education institution. The system can also be used by Malaysian Higher Education institutions to identify potential examiners for Ph.D theses by institutions and area of expertise.

Step 3: Design and development

There are six (6) steps involved at this stage as the following:

- a) User and System Requirements' specifications

Data for users' and systems' requirements were gathered during two MYDEGS meetings and a series of discussions through WHATSAPP messages. It was agreed that the system has three key stakeholders who

are the administrators, the experts or scholars, and potential Ph.D applicants. The administrators are those who can access the whole system and are able to manage and edit or update the data in the system. The experts are supervisors who can view their colleagues in other institutions so that they can identify potential theses examiners to be nominated. They can also update their background information including profile picture. Users of the system will be the potential Ph.D candidates who can browse for suitable supervisor/s in the relevant area of research. The data required for the system, among others, is the list of experts/supervisors by institutions, research fields, number of completed supervisions, and number of current supervisions. The data was supplied by representatives from all participating institutions who are members of MYDEGS.

b) Analysis

At this step, the user requirements were analysed in detail and converted into process flow diagrams and identification of the number of entities in the database. The system and technology requirements (software, hardware, network, database server) were also analysed. In this aspect, the system was developed using PHP open- source scripting connected to MySQL database.

c) Design

At this step, the layout and user interface of the system were designed, the Entity Relationship Diagrams (ERD) was created, and the business rules and format for the database were determined, and pseudo codes were written.

d) Coding

Next is the coding phase whereby the source code was built according to a design that has been translated from needs analysis and obtained from the target users.

e) Testing

During testing step, systematically searching for errors, bugs and defects were conducted. Testing is an important phase as it determines whether the users' needs based on the analysis and design are achieved.

f) Operations

Once completed, the system was installed by uploading the related files onto the database server. The URL was created for live audience.

Step 4-6: Demonstration, Evaluation, and Communication

The next three steps were Demonstration, Evaluation, and Communication. The system was demonstrated in one of the MYDEGS meeting and then feedbacks from all members were gathered to further improved the system in the future. All MYDEGS members were encouraged to test the system and provide further feedbacks if there was any. Evaluation of the system is a continuous process aimed at improving the system from time to time as new requirements arise. Finally, the research team requested all MYDEGS members to use the system.

FINDINGS

The following figures present examples of the screen display of MYDEGS system that has been produced based on the user requirements of MYDEGS.

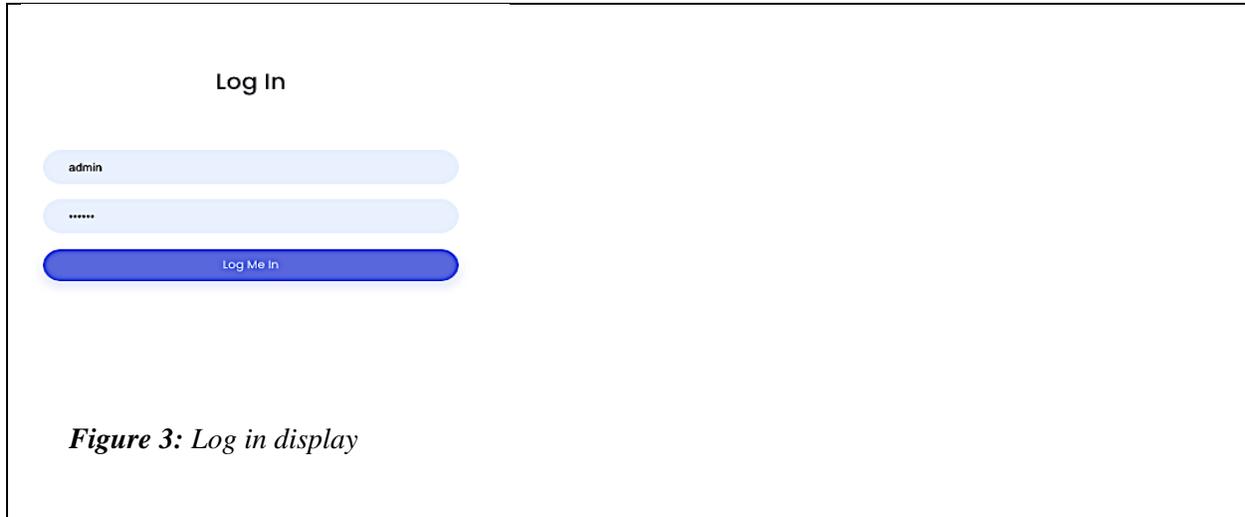


Figure 3: Log in display

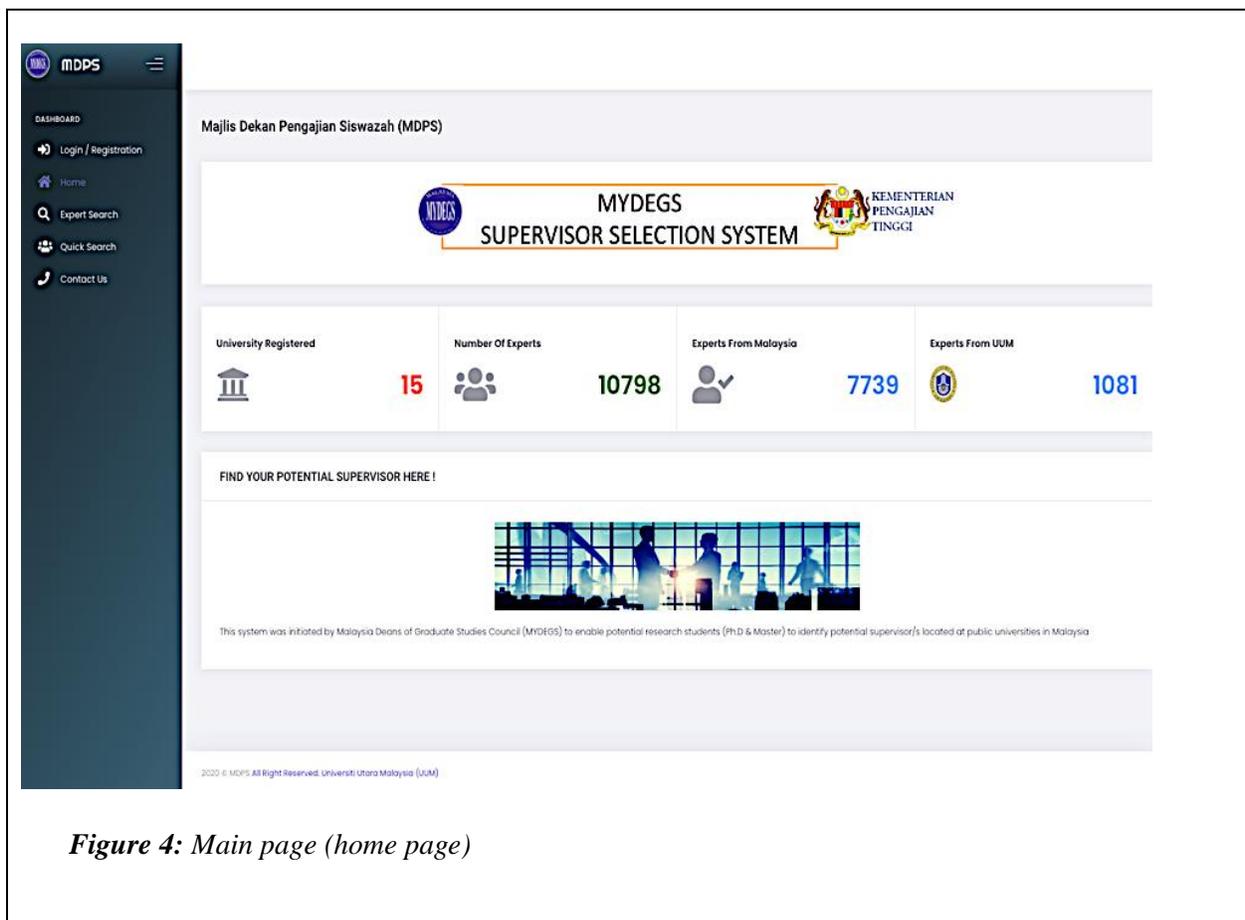


Figure 4: Main page (home page)

Once users logged in (Figure 3), they will be directed to the main page as shown in figure 4. In the main page, apart from the menu list, users will be presented with useful information such as the number of registered universities and number of experts. The main page is the gateway for users to start searching for experts by universities or area of expertise (see figure 5 and 6). Should users need further enquiries regarding the system and information provided by system, they can contact the system administrator (see figure 7).

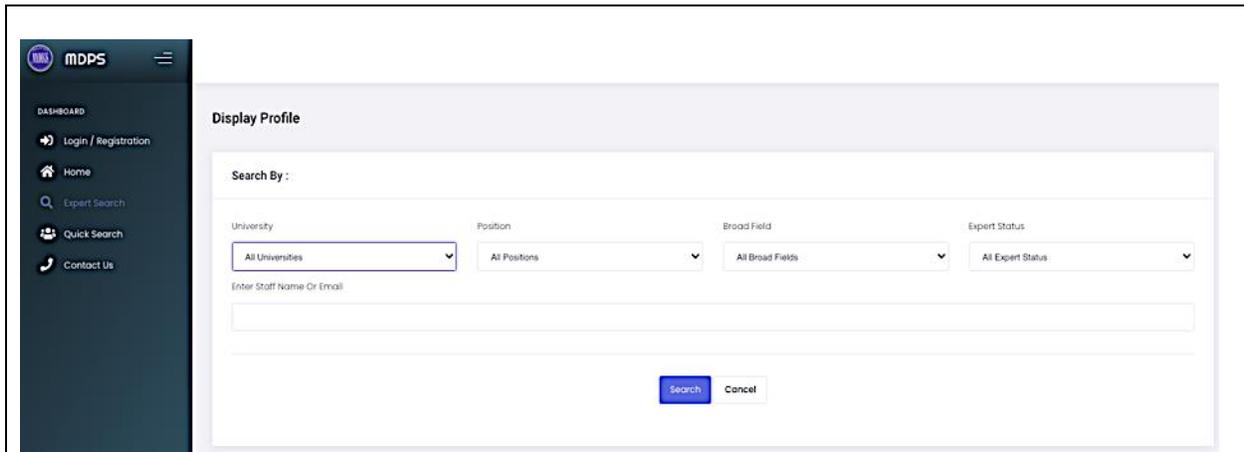


Figure 5: Supervisor search function

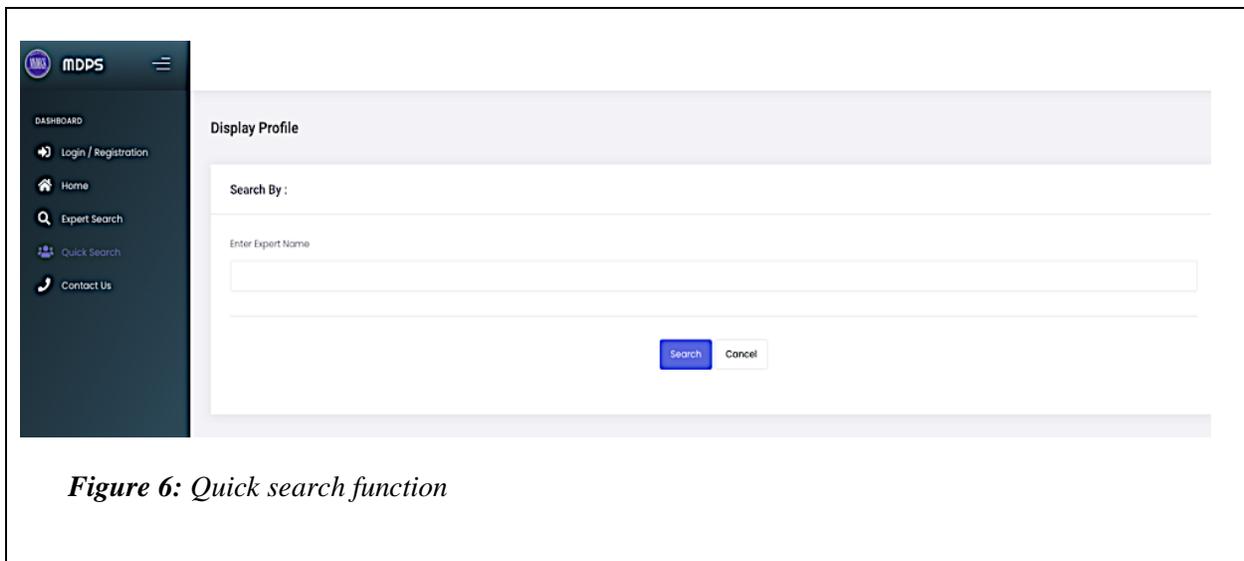


Figure 6: Quick search function

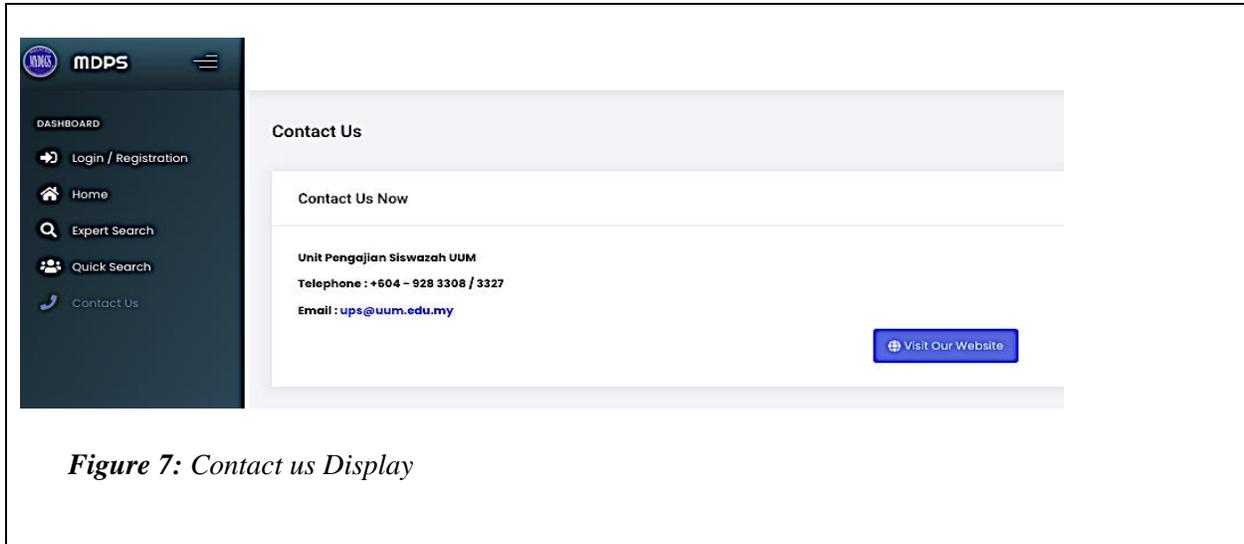


Figure 7: Contact us Display

Figure 8 and figure 9 show examples of the result page when users search for experts or potential supervisors. Apart from the experts' profile photos, some useful information are displayed in this page which includes full name, qualification, email, links to curriculum vitae, google scholar and research Gate, personal information (e.g. staff number, position, gender), and additional information (e.g. highest qualification, field of expertise, employer, number of graduated supervisees/ students).

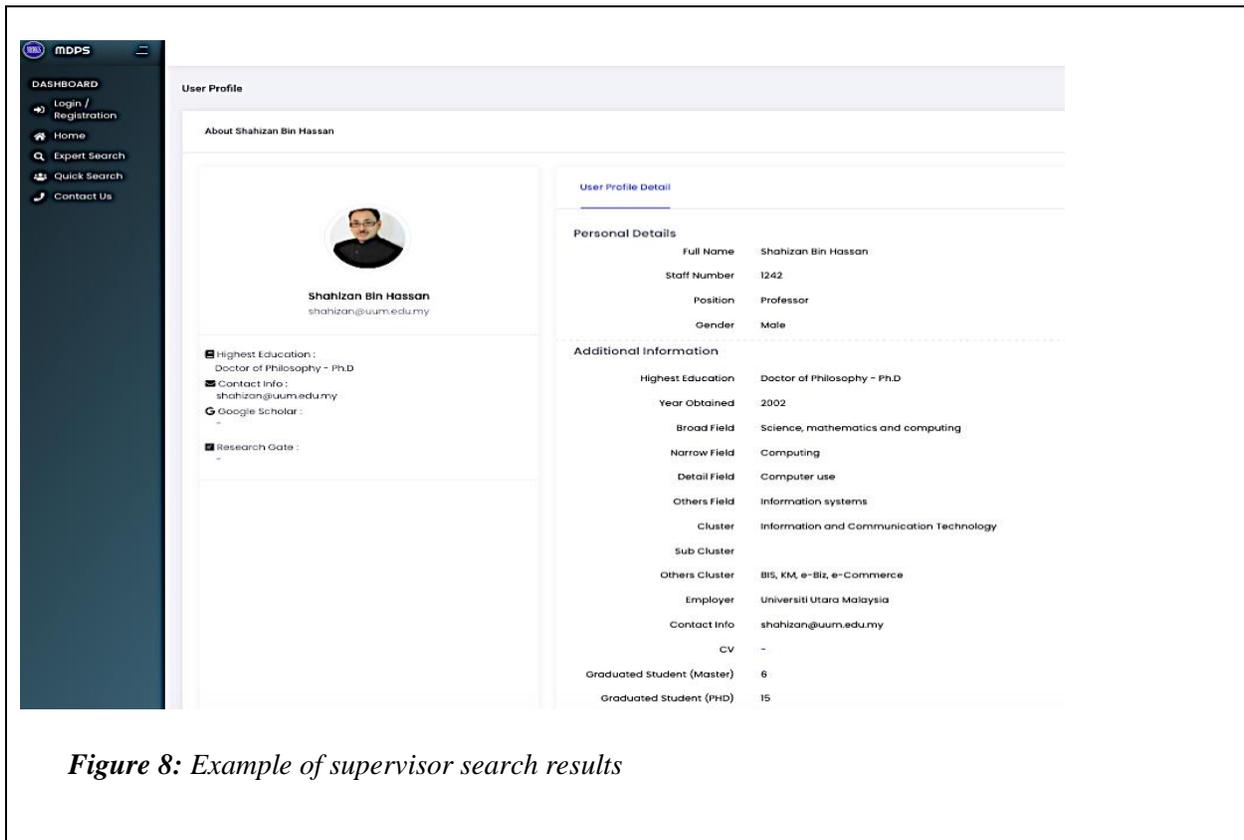


Figure 8: Example of supervisor search results

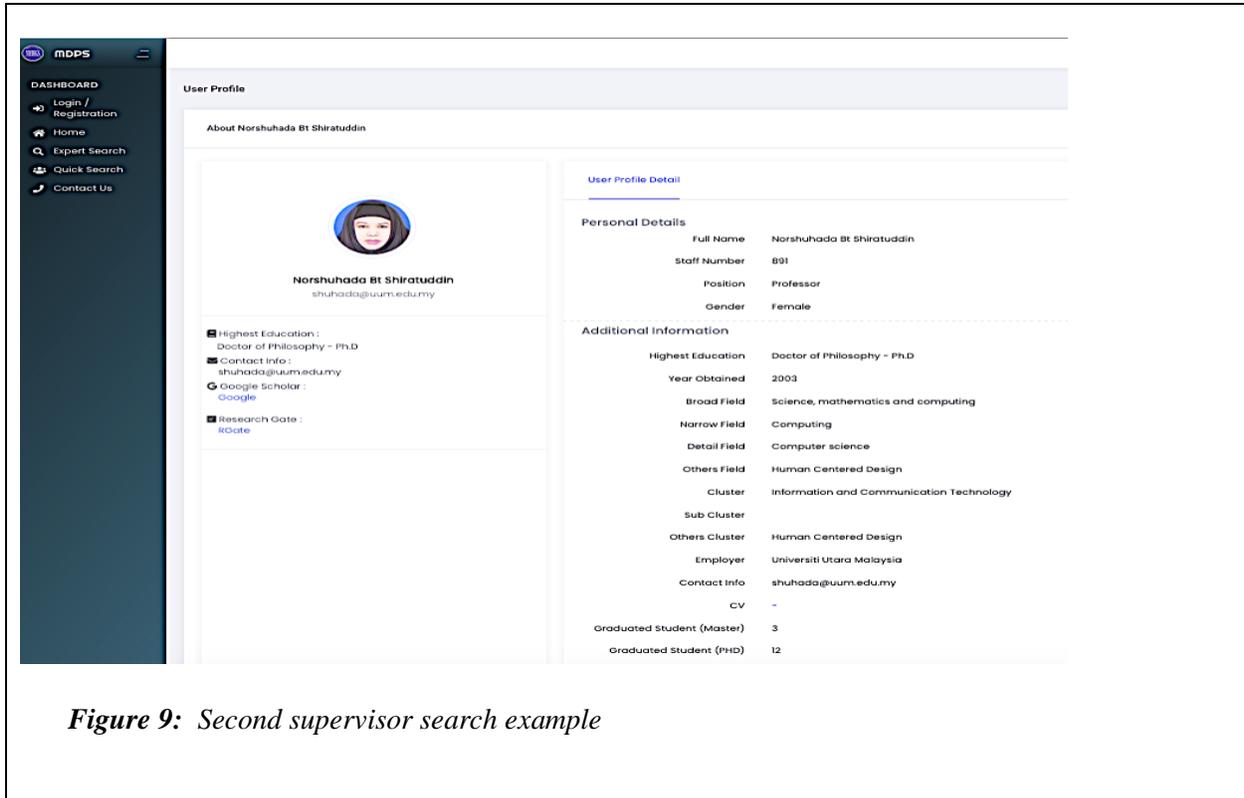


Figure 9: Second supervisor search example



Figure 10: List of students by Institutions

Figure 10 presents an example of search report results on list of supervisors by institutions where field, gender and activation level data are listed. The actual data was hidden due to confidentiality factor.

DISCUSSION

The system has successfully recorded data up to Jan 2020 (refer figure 11) for almost 2,000 experts/supervisors and over ten thousand students supervised by all supervisors in public institutions of higher learning in Malaysia comprising twenty higher education institutions. The system testing phase was carried out by all parties involved. The system was found to be working properly and no record of instability or problems was recorded. The system was also found to be useful for potential Ph.D programme applicants in terms of identifying and selecting the right supervisors for their research projects.



No	University Name	Number of Experts	Students Master Ongoing	Students Master Graduated	Total Number Master Student	Students PhD Ongoing	Students PhD Graduated	Total Number PhD Student
1	Universiti Kebangsaan Malaysia	1966	4891	8302	13193	5775	4385	10161
2	Universiti Putra Malaysia	1403	6251	3608	9859	5175	4857	10042
3	Universiti Sains Malaysia	1081	176	384	560	1833	1805	3738
4	Universiti Tun Hussein Onn Malaysia	1069	825	2818	3643	1188	540	1728
5	Universiti Islam Antarabangsa	1010	2257	4522	6779	2896	2295	5191

Figure 11: Overall information of successfully recorded data as of January 2020

The system is beneficial to all stakeholders who obviously need the access for different purposes. The applicants, for example, are able to search for potential supervisors in a specific area by just browsing this system. They can get the information such as experts' area of research, the universities they work with, the number of current supervisees, and the number of completed supervisions. This information is imperative in guiding them to select potential research supervisors. On the other hand, the post graduate administrators can also utilise the system to identify potential theses examiners in various fields. The information which includes experts' research experience, link to curriculum vitae, and the number of completed supervisions is valuable indeed in the process of selecting theses examiners. Other stakeholders particularly the researchers are also able to benefit from the system whereby they can browse the system to get information regarding potential research collaborators and partners in specific research projects or to apply for research grants. Most research grants offered by various agencies require applicants to have collaborative partners among several universities and therefore the information provided by the system will definitely be very useful. Last but not least, the university management can use the system as a source of reference for staff appraisal and promotions.

Although the primary purpose of the project is to propose and develop the theses supervisor selection system, there is an emerging issue that requires attention from the post graduate education management of all universities and also the Ministry of Higher Education, Malaysia. Among others, the issue of quality supervision. It was found from the system that there are supervisors in a number of universities who are currently supervising too many Ph.D students. Suprisingly, a significant number of supervisors have more than 20 students to supervise concurrently which raises the issue of quality supervision considering the fact that supervisors also have other important responsibilities such as teaching, conducting research and consultations, and engaging in community projects. In fact, several supervisors have more than 50 research students at the same time which once again raises the question of how students' theses are supervised. In view of this, it is important for all universities in Malaysia to have a proper control mechanism to limit the number of supervisions so that the quality of supervision can be maintained. A number of universities such as Universiti Utara Malaysia have already deployed such a mechanism and as a result the ratio of supervisor and supervisee is now more reasonable and practice.

CONCLUSIONS

Despite many challenges in developing the system particularly in gathering the data on supervisors from public universities in Malaysia, the project was considered a success. Corporation and commitment given by all stakeholders were commendable. The project clearly shows the importance of Malaysian public universities to collaborate in promoting their respective post graduate education programmes globally via the use of technology. There is an indication that the system is very useful for potential Ph.D programme applicants in terms of identifying and selecting the right supervisors for their research projects. The system is also useful for the other parties such as the Ministry of Higher Education and Institutes of Higher Learning to get access to experts in various fields who are currently available in Malaysia. Indeed, system like this can become a gateway for identifying experts and researchers in various fields who are currently serving in Malaysia Institutes of Higher Learning. Similar efforts can be initiated by Institutes of Higher Learning to improve the management of their academic programmes.

Despite its success, MYDEGS system has some limitations. First, it requires the participating universities to provide and update the data of supervisors continuously, at least twice a year. This definitely demands strong commitment from the system administrator of respective universities to keep on updating the database. Second, some universities are reluctant to release certain data which is considered confidential such as the number supervised students by every researcher. Third, MYDEGS system is a fully working prototype developed specifically for this study. In order to implement the system fully, the Ministry of Higher Education through MYDEGS should take over its ownership and prepare for the system for full implementation nationwide.

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