

## Implementation of a Student Satisfaction Index System for Higher Education Institutions

Nurul Haslinda Ngah<sup>1\*</sup>, Syahrul Fahmy<sup>2</sup>, Wan Roslina Wan Othman<sup>1</sup>, Hanyza Ahmad<sup>3</sup>, Nurhasmiedayu Hashim<sup>1</sup> and Muhammad Rahemmi Md Rawi<sup>4</sup>

<sup>1</sup> Faculty of Computer, Media & Technology Management, University College TATI, Malaysia

<sup>2</sup> Big Data Institute, University College TATI, MALAYSIA

<sup>3</sup> Department of Academic & Quality Management, University College TATI, MALAYSIA

<sup>4</sup> Department of Information Technology Management, University College TATI, MALAYSIA

Corresponding author e-mail: [haslinda@uctati.edu.my](mailto:haslinda@uctati.edu.my)

KEYWORDS	ABSTRACT
Higher Education Institutions Student Satisfaction Index System Development Agile Method	The quality of service provided by Higher Education Institutions (HEIs) is not only viewed as an important factor for education excellence, but also a significant factor in attracting new students whilst retaining existing ones. Malaysian HEIs have been given much attention to the quality of services offered to all stakeholders especially students. Student feedback provides valuable input to HEIs for improving its services, supporting strategic decision-making activities and providing insights to process change. There are several approaches to obtain student feedback including surveys and interview sessions. The manual process for obtaining student feedback have been reported to incur high administration cost, labour-intensive, error-prone and low return rate. This work proposes a Student Satisfaction Index System (SSIS) to address these issues. SSIS was developed using PHP with MySQL as the database and integrated with an existing system which hosted on CentOS Linux. Black-box and white-box testings were carried out by the end-users and system developers respectively. Comments by the end-user include timely report generation, a 100% return rate, and automatic calculation of student satisfaction levels. The system is accessible 24/7, easy to use, and facilitates the management of student feedback, with regards to the services offered by the institution. SSIS can be adapted by other HEIs with minor modifications. Future work would include a more complex statistical analysis and the use of big data and data analytics to project future trends and issues.

Received 14 Dec 2022; received in revised form 27 February 2023; accepted 31 March 2023.

## 1.0 Introduction

Customer satisfaction is of utmost importance for product suppliers and service providers. Satisfaction is commonly gauged through customer feedback, official ratings and accreditation by relevant bodies. The quality of service provided by Higher Education Institutions (HEIs) is not only viewed as an important factor for education excellence [1], but also is a significant factor in attracting new students whilst retaining existing students. In the context of Malaysian higher education system, the quality of service also affects institution ratings in SETARA, a rating system for HEIs. As such, Malaysian HEIs have been given much attention to the quality of services offered to all of its stakeholders.

One of the stakeholders for HEIs are the students. Student feedback provides accurate and timely response to the educators and institutions [1-2]. Not only it evaluates the performance of academic staffs [3], student feedback also provides valuable input to the institution for improving its services, supporting strategic decision-making activities and providing insights to process change.

There are several approaches to obtain student feedback including surveys and interview sessions. To maintain and control the quality of service, the HEI conducts a yearly satisfaction survey to all undergraduate students organized by the quality unit. The timing of the survey is planned according to the academic calendar of undergraduate students to ensure a high rate of response. The survey covers the satisfaction index provided by both academic and supporting departments. Students were given listed questions and an open-ended remark column to express their concern or focus on their experiences that they wish to highlight to the administrative. The result of the survey and all remarks presented in the Management Review Meeting and audit findings (both academic and nonacademic audits) provide an overall spectrum of maintaining and controlling the institution's quality.

At University College TATI, the periodic collection of student feedback is tasked to the Quality Unit and presented in the Management Review Meeting. Currently, the collection process is done manually. Not only the administration cost is high, it is also labour-intensive, error-prone and with low return rate as reported by [4]. As such, this work proposes the design and implementation of a Student Satisfaction Index System (SSIS) to address these issues.

This project is undertaken by the Software Engineering Research Group at University College TATI. The group is actively involved in the development of computerized solutions to address real-life issues. Past projects include a search portal for HEIs in Malaysia [5], an online community security system [6], an App for the tourism industry [7], an App to check the status of Islamic preachers in Malaysia [8] and a system to evaluate the quality of e-Book [9].

## 2.0 Initial Study

The quality of HEI services is perceived as being synonymous to its reputation, rating, and student experience. Satisfaction could be defined as “*user evaluation and expectation of a product or service*”. Student satisfaction in the context of HEI can be defined as “*fulfilment of academic, extra-curricular activities and facilities utilization*”. Student satisfaction indicates the level of fulfilment with regards to products and services offered by the HEI based on prior expectations [10].

The assessment of student satisfaction is a challenging task, but the results are invaluable for HEIs in building a strong and lasting relationship with graduates, current students and prospective students. Student satisfaction are highly dependent on the quality of the services provided by HEIs [10]. Student satisfaction can be divided into four broad categories: entry standards, research assessment, student satisfaction and graduate prospects [11]. One approach for gauging student satisfaction is through the use of a “*student satisfaction survey*” [12].

Similar systems for evaluating student satisfaction from three Malaysian HEIs were analysed in determining a common set of features. Results revealed five general characteristics namely *Effectiveness, Efficiency, Registration, Learnability* and *Bilinguality* (Table 1).

Table 1: Comparison of HEI SSIS

Characteristics	HEI(a)	HEI(b)	HEI(c)
Effectiveness	√	√	√
Efficiency	√	√	√
Registration	X	√	X
Learnability	√	√	√
Bilinguality	√	X	√

Effectiveness refers to the ease of use, efficiency refers to the capability of the system to respond to users' needs, registration refers to need for formal identity (non-anonymous). Meanwhile, the learnability refers to clear instructions and guidelines, and bilinguality refers to the use of more than language in system.

### 3.0 System Requirements and Design

The Agile method was adopted to guide the project as the end-users were very committed and dutifully participated throughout the design and development phases. The selection of Agile was largely influenced by the successful rate of projects [12] and the increasing acceptance rate by software developers [13].

#### 3.1 System Requirement

Interview sessions with the end-users at the Quality Department was held to get an overall view of the proposed system, covering system dependencies and identifying main characteristics of the proposed system. These information were analysed and a set of functional and non-functional requirements were derived. Example of these requirements is presented in Table 2.

Table 2: Example of Functional and NFR for SSIS

No	Requirements
1	The system will be integrated with the current Student Portal.
2	The system allows each student to fill up the survey once in a year.
3	The system will enforce the students to fill up and submit the survey before accessing other
4	The system will administer the survey based on system administrator setting.
5	The system will enforce each student to answer all survey questions.
6	The system will generate the summary of the survey input by students.
7	The system allows administrator to update the survey questions.
8	The system will allow only second semester and above students to fill up the survey.

#### 3.2 System Design

Once the requirements have been formalized and agreed upon by the end-users, a detailed process flow was developed. Figure 1 illustrates the system's process flow whilst Figure 2 illustrates the context diagram for SSIS. There are three main users of the system: *Student*, *Faculty* and *Quality Unit*, which also acts as the administrator for the system.

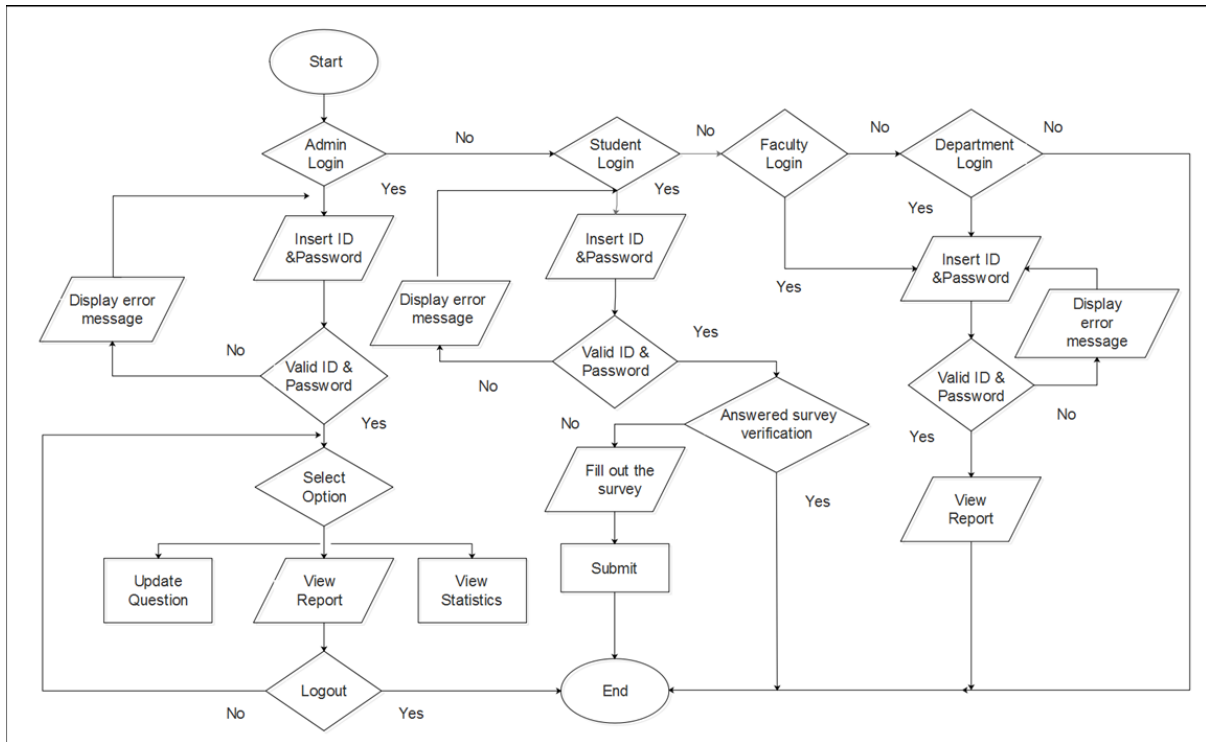


Figure 1: System Flowchart

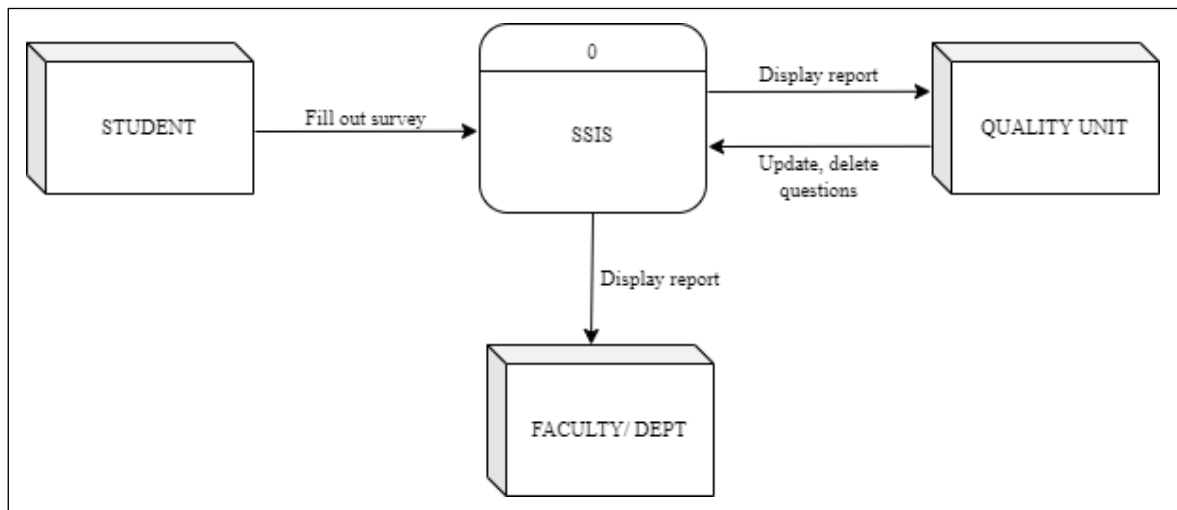


Figure 2: SSIS Context Diagram

Six tables were identified and created in the database for the system (Figure 3).

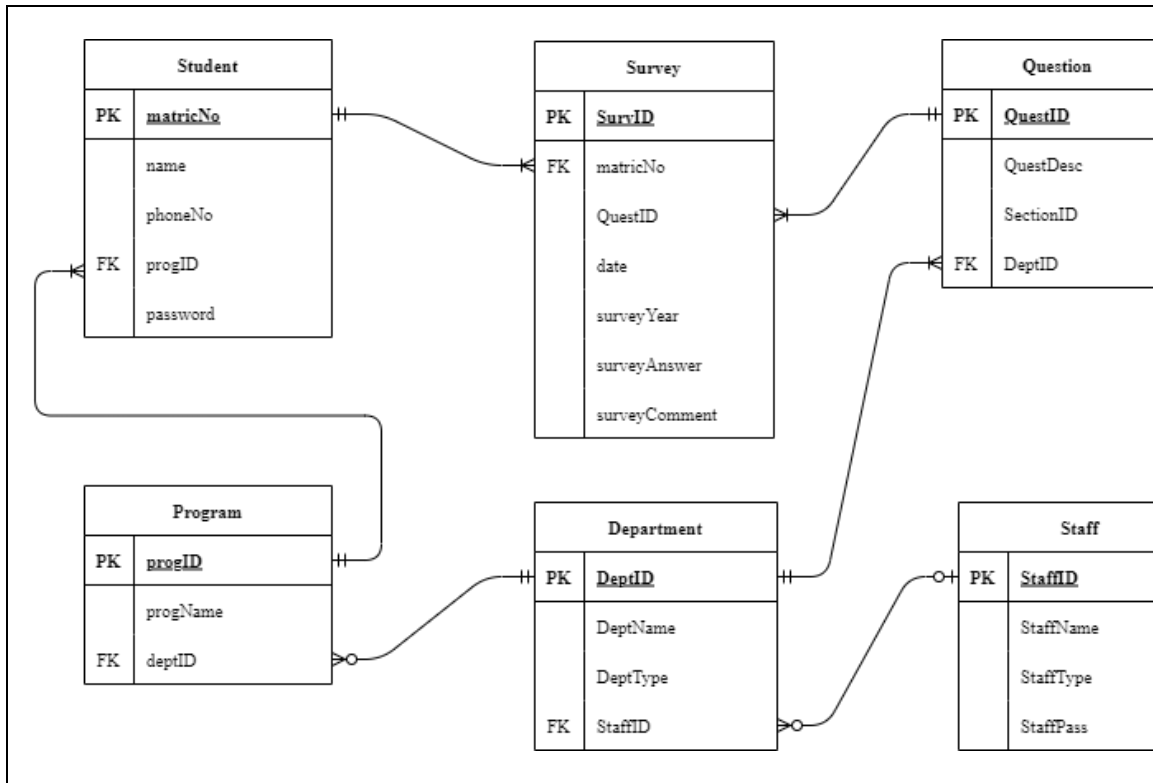


Figure 3: Entity Relationship Diagram

#### 4.0 Implementation and Testing

SSIS was developed using PHP with MySQL as the database. It was integrated with an existing system, hosted on CentOS Linux platform. PHP version 7.0 was used to ensure compatibility with CentOS Linux 6.8 version server. The interface was designed using HTML with embedded CSS. Figure 4 illustrates the survey results as displayed by the system, highlighting the average level of student satisfaction with regards to the HEI services.

[Back](#) [Refresh](#) [Cetak](#)

Penilaian oleh pelajar adalah berdasarkan keseluruhan Fakulti/Pusat Pengajian	Tidak Berpuashati (%)	Berpuashati (%)	Responden
<b>JABATAN PENGURUSAN AKADEMIK &amp; KUALITI</b>			
Pengendalian pendaftaran kursus pada setiap semester mengikut jadual yang ditetapkan			1476
Masa dan lokasi kuliah yang bersesuaian			1473
<i>Kebolehcapaian Maklumat</i>			
a. Jadual peperiksaan			1477
b. Keputusan peperiksaan			1471
c. Konvokesyen			1469
Sentiasa mendapat maklumat terkini berhubung dengan perjalanan akademik			1475
Perkhidmatan di kaunter adalah mesra, cekap dan tepat			1477
Layanan dan komunikasi pegawai			1472
Purata			
<b>JABATAN HAL EHWAL PELAJAR &amp; ALUMNI</b>			
Pengurusan aktiviti pelajar			1476
Proses pendaftaran keluar masuk asrama			1474
Proses pengendalian aduan/cadangan pelajar			1473
Urusan pinjaman pelajaran			1472
Perkhidmatan di kaunter adalah mesra, cekap dan tepat			1474
Perkhidmatan di cafeteria			1473

Figure 4: Student Satisfaction Survey Results

Black-box and white-box testings were carried out by the end-users (Quality Unit staffs) and system developers respectively. Both tests ran for a period of two weeks with glitches reported in the first week. Minor modifications were made to the user interface and by the end of the first week, SSIS was running flawlessly, producing expected results. Among significant comments made the end-user include the timely manner of report generation, a 100% return rate was achieved, and the automatic calculation of satisfaction levels. Overall, SSIS has achieved its main aim and objectives.

## 5.0 Conclusion

This paper has presented SSIS, a web-based Student Satisfaction Index System for Higher Education Institution. This system is accessible 24/7, easy to use, and facilitates the management of student feedback, with regards to the services offered by the institution. Tests have proven that the system provides timely delivery of results with a 100% return rate. SSIS system can be adapted by other HEIs with minor modifications. Future work would include a more complex statistical analysis of the results and the use of big data and data analytics to project future trends.

## Acknowledgments

This research is supported by UC TATI Short-Term Grant (STG) GPJP 1/2020 9001-2007. The authors fully acknowledged University College TATI (UC TATI) for the approved fund, which makes this important research viable and effective.

## References

- [1] S.A. Dar 2018 Faculty Feedback Management System *International Journal of Advance Engineering and Research* 5 pp 852-855.
- [2] L.M. Fahad *et al* 2020 Electronic Student Feedback Management System Based on Web Development *Science in Information Technology Letters* 1 pp 73-82.
- [3] P. Josephat *et al* 2020 Undergraduate Students' Satisfaction Survey at the Higher Learning Institution of Dodoma *Journal of Education Research and Behavioral Sciences* 3 pp 45-53.
- [4] P. Gangurde *et al* 2020 Survey Paper on Web based Student Feedback System *International Journal of Computer Sciences and Engineering* 7.
- [5] N. Aziana *et al* 2020 Design and Development of a Search Portal for Private Higher Education Institutions in Malaysia *International Journal of Synergy in Engineering and Technology* 1 pp 62-69
- [6] N.H. Ngah *et al* 2020 An Online Community Security System for Preventing Home Burglary *International Journal of Synergy in Engineering and Technology* 1 pp 28-37
- [7] S. Fahmy *et al* 2020 Creating a New Tourism Workforce through ICT *INWASCON Technology Magazine* 2 pp 25-28
- [8] S. Fahmy *et al* 2019 Design and Development of e-Daie, an App to Check the Status of Islamic Preacher in Malaysia *Proceedings of the International Conference on Islamic Civilization and Technology Management* pp 430-439
- [9] S. Fahmy *et al* 2014 Computer Support System for Evaluating Software Quality in e-Book *Australian Journal of Basic and Applied Sciences* 8 pp 142-149
- [10] L. Temizer and A. Turkyilmaz 2012 Implementation of Student Satisfaction Index Model in Higher Education Institutions *Procedia - Social and Behavioral Sciences* 46 pp 3802-3806
- [11] O.H.S.T.D *et al* 2015 Students' Satisfaction Index: A Case Study in SGU *International Conference on Innovation, Entrepreneurship and Technology*
- [12] Standish Group 2020 *CHAOS Report 2020*
- [13] D. M. Alina and M. A. Maria 2018 From Waterfall to Agile Software: Development Models in the IT Sector, 2006 to 2018 *Impacts on Company Management. Journal of International Studies* 11 pp 315-325