Managerial Implications of Student Activity Information System Implementation at Faculty of Business and Management

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ABSTRACT

Faculty of Business and Management – Student Activity Information System (FBM-SAIS) was developed with an aim to manage the student activity application process effectively through the Internet. This study was conducted to determine the managerial implications of FBM-SAIS implementation to FBM, UiTM Selangor by focusing on the manpower and financial impact, as well as to determine the direct effect of SAIS Service Quality on SAIS student satisfaction. This study proposed SAIS Service Quality as a higher-order factor in order to determine a direct effect of SAIS Service Quality on student satisfaction towards SAIS implementation. Interviews were conducted to identify the managerial implications of student activity application process before and after SAIS implementation. Meanwhile, the quantitative data was gathered from 94 SAIS users who were FBM students through e-survey and was analyzed by using SmartPLS 3.0. The interview results showed that the implementation of SAIS did have an impact on the Faculty, such as increasing staff productivity and reducing costs. Moreover, the PLS-SEM analysis results showed that SAIS Service Quality positively influenced student satisfaction towards FBM-SAIS implementation. This study provides an empirical validation of the SAIS Service Quality Model in the context of Higher Education.

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Keywords: *information system, student activity, e-service quality, user satisfaction, financial implications, higher education*

INTRODUCTION

Service quality is crucial in the service industry and is usually discussed in marketing research (Teeroovengadum, Nunkoo, Gronroos, Kamalanabhan & Seebaluck, 2019). However, the concept of service quality is rarely used in the Higher Education sectors. In spite of that, providing good service quality in Higher Education (HE) is important because students are also considered as customers. This is due to the fact that HE has a large number of students and it is essential to provide good service to the customers (Al-dweeri, Ruiz Moreno, Montes, Obeidat & Al-dwairi, 2019). Therefore, one of the aspects that needs to be reconsidered for improvement in universities is service quality.

With the rapid growth of the Internet over the years, many people nowadays engage in online activities. Online service quality or e-service quality offers an opportunity to HE to improve their performance in terms of providing excellent managerial service for their customers (Santos, Marques, Justino & Mandes, 2020; Geraghty, Bromley, Bull, Dube & Turner, 2019). In response to this, the Faculty of Business and Management (FBM), UiTM Puncak Alam Campus, Selangor, Malaysia has introduced the Faculty of Business and Management Integrated System (FBMIS). FBMIS is an integrated system which was developed to overcome the fundamental problems in handling the managerial tasks in the Faculty. The Faculty of Business and Management-Student Activities Information System (FBM-SAIS) is one of the information systems developed under the FBMIS project that provides a centralised repository of student activity record. Several improvements on managing the student activity information have been done based on the feedback of the stakeholders such as students, Programme Coordinators, Head of Learning Department as well as officers from the Student Affairs Office. FBM-SAIS has replaced the need to fill out a printed form to submit a proposal for every student activity in the Faculty. Hence, this system helps to reduce several processes such as getting signatures from the Programme Coordinators, Head of Learning Centre and Deputy Dean of Student Affairs.

The validations and approvals which were previously done by getting the signatures from designated authorities are now a click away and at the user's fingertips. With phone calls or messages to the person-in-charge, the process of getting approval, which formerly took several days, now only takes several minutes to be approved. Since FBM-SAIS is available 24 hours, seven days a week, students no longer have to wait for office hours to submit their activity applications. Students can go online to submit their proposals at any time and within a short period of time. They will be able to check the application status from the system once they login and they can print the approval letters if necessary, without going to the Student Affairs Office. This system has tremendously improved the processing time, processing procedures, cost of printing and filing system of students' activities. Hence, this study is aimed to determine the managerial implications of the FBM-SAIS implementation in the Faculty besides determining the direct effect of SAIS Service Quality on student satisfaction towards the implementation of FBM-SAIS.

LITERATURE REVIEW

Management of Student Activity Application

There are few issues that the Student Affairs Office need to reconcile in terms of the student activity management system. Starting from the preparation of working paper, filling-in the activity form, submission of forms and working paper, lengthy approval processes and lastly, to the submission of activities report-all processes take up a considerable amount of time and resources. Alshareef, Alkilany, Alweshah and Abu Bakar (2015), in their research to introduce Student Information System (SIS) in Sebha University of Libya (SUL), stated that the existing student database contained a lot of noise data and incorrect information. They suggested that the problem could be solved through the implementation of integrated student database with the new SIS that they were going to introduce. The advantages of SIS inspired the Faculty of Business and Management, UiTM Puncak Alamto introduce the new system under the name of FBM-SAIS. With the existing internet technology, FBM-SAIS could be done online where the process of application and approval is simple, user friendly and accessible anytime and anywhere. Manpower will also be reduced as the system is supervised by only one or two people.

Additionally, the advantage of a database system is its capability to store a huge amount of data on student activities (Polina, Oxana & Kyeniya, 2014).

An online database system also plays a significant role in collecting, analyzing and reporting data. Apart from collecting data, the system also conducts online surveys on student activities. Previous literature stated that the Electronic Student Information Portal (eSIP) enhances the effectiveness in suggesting comments and feedbacks and detecting link addresses easily which have the least mean in user accessibility and system quality respectively by improving the accessibility of users to suggest comments and feedbacks, as well as improving the organization and internal process (Ossama, 2016; Omeluzor & Akinwoye, 2016). Through online survey, data can be easily analyzed and reported in a very short time. FBM-SAIS has implemented the idea through Google form links where the survey was shared among students by using the QR code.

Customer Satisfaction

Customers are the heart of every business. Therefore, one of the business strategies that all organizations have to observe is increasing the service quality satisfaction of their customers (Kitsios, Stefanakakis, Kamariotou & Dermentzoglou, 2019). An excellent service quality is necessary for all sectors including the Higher Education institutions due to the requirement of delivering good quality services to the stakeholders that will help the institution gain its competitive edge. In general, user satisfaction is described as a user's evaluation of the total utilization connection with the service, which clearly influences behavioural intentions or post-action phenomena such as attitude change, repeating action and loyalty (Santa, MacDonald & Ferrer, 2019). Verkijika and De Wet (2019) argued that positive and negative affective responses were partially due to user attributions concerning their satisfaction towards e-service quality in general. Hence, any advancement in the quality of service which is not based on the user's needs would not lead to an enhancement in user satisfaction (Wang, Ou & Chen, 2019).

Moreover, disappointment may lead to customers spreading negative comments; tarnishing the reputation of the organization

(Muhamad Zulhelmi, Salim, Sabainah & Maria, 2018). Several recent studies argued that a customer's evaluation of service quality will influence customer satisfaction (Kitsios *et al.*, 2019; Wang *et al.*, 2019; Muhamad Zulhelmi *et al.*, 2018; Rizwan, Leifu, Muhammad Yasir & Mudassar, 2015; Wang, Hu, Guo, Sun, Geng & Voon, 2019). In the marketing world, a customer's satisfaction may influence the customer to repurchase the products (e.g. Iberahim, Zulkurnain, Rajah Aina Shah & Rosli, 2019; Rita, Oliveira & Farisa, 2019). Therefore, the element of service quality plays an important role because the biggest challenge is to sustain customer satisfaction.

E-Service Quality

According to Lee and Lin (2005), e-service quality can be described as the total users' evaluations and judgments pertaining to the excellence of e-service delivery. E-services in academic institutions, offer a never-ending opportunity for the institutions to utilize its academic and management processes as well as new services. Parasuraman, Zeithaml and Berry (1988) proposed the SERVQUAL model which is used to clarify the development of a multiple-item scale for gauging service quality and assessing the scale's assets and potential of its application. SERVQUAL, which was constructed from several dimensions of service quality (Barnes & Vidgen, 2002, Santos, 2003, Raman, Stephenaus, Alam & Kuppusamy, 2008, Lee & Lin, 2005) started with ten dimensions. The ten dimensions were tangibility, reliability, responsiveness, competency, communication, credibility, security, access, courtesy and understanding of the customer. Previous e-service models which were developed by Heinonen (2006), Essen and Conrick (2008) presented different sub-dimensions of e-service quality such as the ease in usage, technical quality and content quality. According to Nunkoo, Teeroovengadum, Thomas and Leonard (2017), previous studies discussed the multi-dimensions of e-service quality, and these multidimensional constructs could be dealt with using a second-order factor model (Chen *et al.*, 2005). The model signifies the hypothesis that is seemingly distinct, but related, whereby the sub-dimensions can be accounted for by an underlying higher-order construct such as service quality (Nunkoo *et al.*, 2017). In fact, according to Teeroovengadum *et al.* (2019), there are several benefits if the researcher adopts the second-order factor model. Some of the benefits include the model being able to explain the covariance in a more prudent way and also reducing the number of

variables that can be tested in a structural model in a meaningful way without losing the theoretical rigor.

This study adapts four criteria of e-service quality for assessing SAIS Service Quality: ease of use, information quality, reliability and system security. According to Parasuraman *et al.* (1988), ease of use is expressed as how easy it is for the users to get information within the website. A vital criteria that users normally observe is the structure and layout of the website, functionality, accessibility of information, and understandable contents. Moreover, the information quality is associated with the user's perception of usefulness and quality of website content (DeLone & McLean, 2003). The development of a web-based FBM-SAIS website is relevant for students because the Internet is one of the fastest means of communication and a platform for a massive warehouse of data and information. Thus, the quality of the information provided by the system becomes a highly significant factor in terms of student satisfaction. According to Santos (2003), reliability is defined as the ability to execute the required services accurately and consistently. This incorporates the frequency of updating the website, fast response to user enquiries and accuracy of information. According to Zeithaml, Parasuraman and Malhotra (2000), the security of the system is the level in which the user is confident of the site's safety from intrusion and safeguard of privacy and personal information. Therefore, system security is a huge concern to e-service users due to the user's perceived security having a significant role to guarantee safe transactions and to protect user's personal information. As a result, the study develops the following hypothesis.

H1: *SAIS Service Quality positively influences Student Satisfaction towards SAIS Implementation*

Based on the literature review above, this study proposed the following research model namely SAIS Service Quality Model as shown in Figure 1. This model views SAIS Service Quality as a higher-order factor. There are four dimensions to measure SAIS Service Quality. These dimensions are Ease of Use, Information Quality, Reliability and System Security. This study has one dependent variable, which is the Student Satisfaction towards the FBM-SAIS implementation.

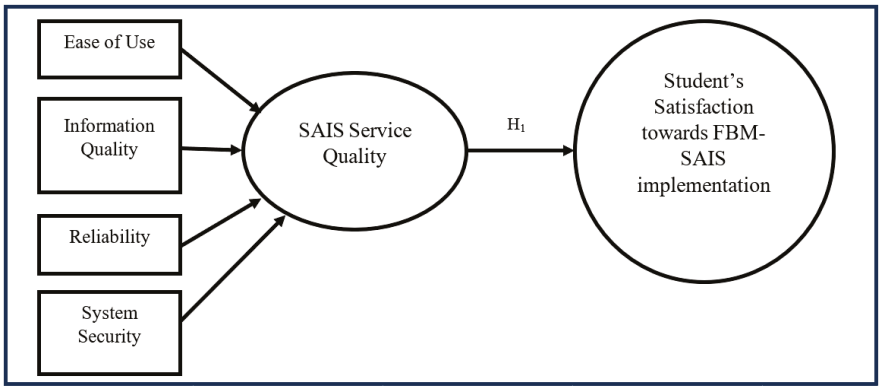

Figure 1. SAIS Service Quality Model

RESEARCH METHOD

To conduct the current study, the flow of the research was divided into five phases – Initial Phase, Planning Phase, Interview Phase, Design and Development Phase and Qualitative Phase, as shown in Figure 2.

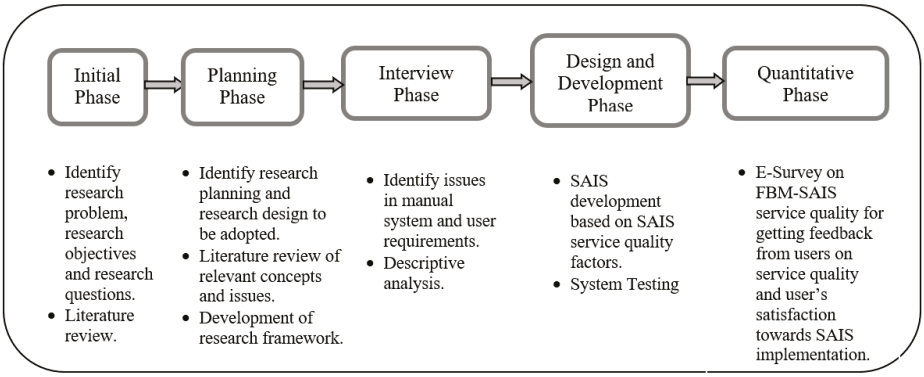

Figure 2: The Research Flow

In the initial phase, previous literature were reviewed with the aim to identify the research problem regarding service quality, especially in the Higher Education contexts. Based on the research problem, the research objectives and research questions were developed.

In the planning phase, the researchers started to plan a research design and develop a proposed research framework. In doing so, the e-Service Quality factors that contributed to user satisfaction towards the development of SAIS were explored and identified through a review of the literature. This search strategy was important to search for the articles that were related to the current study. The researchers also needed to consider the choice of research design to accomplish the research objectives and answer the research questions. The quantitative research technique was chosen for the study. Thus, SAIS e-Service Quality model and research hypotheses were constructed. The proposed research framework namely, SAIS Service Quality Model was tested at the final phase of the research flow.

In the interview phase, the interviews were done with three participants who had previous experience in managing the student activity applications at FBM, UiTM Puncak Alam Campus. In this case, the participants were the officers from FBM Student Affairs Office (HEP Coordinators and Deputy Dean of Student Affairs). The interview questions were constructed to get feedback from the participants regarding the process of managing student activity application in FBM. The interview data was analyzed to identify the manpower hour reduction and financial implications before and after the FBM-SAIS implementation. Moreover, this stage also helped to identify SAIS user requirement. The SAIS user requirements were analyzed using a Unified Modelling Languages (UML) technique which helped the System Developer to design and develop SAIS.

In the design and development phase, the interview results of the SAIS user requirements led to the development of the FBM-SAIS as discussed above. In addition, the development of SAIS Service Quality Model was also finalised. The details of the FBM-SAIS functionalities and its structures were described by using UML through which the user case view and logical view of the system was developed. Then, FBM-SAIS was tested by selected users, who were the administrators from FBM Student Affairs Office and FBM students. The objective of the system testing was to ensure the success of FBM-SAIS functionalities and whether the new system had met the user requirements. Additionally, this also helped to determine whether the proposed system was effective to improve the conventional process of managing student activity applications at FBM.

Finally, the last phase of the study was the quantitative analysis. In this phase, SAIS Service Quality questionnaire was constructed. The questionnaire items were adapted from e-service quality literature. Using e-survey method, the questionnaires were distributed to all SAIS users, who were students of FBM, UiTM Puncak Alam campus with experience in using FBM-SAIS for two semesters. The information on FBM-SAIS users was retrieved from FBM-SAIS database. Based on the record, a total of 185 students registered as FBM-SAIS users. However, only 94 students responded to the e-questionnaire distributed during the final stage of the research flow.

The G-power software was used to calculate the minimum sample size required for this study. Since the model had a maximum of 1 predictor (as shown in Figure 1), with a small effect size (0.25) and the power needed as 0.95, the minimum sample size required was 89 respondents. Therefore, the total sampling requirement was fulfilled for the study. SPSS version 21 was used to key in and clean the e-survey data. Meanwhile, PLS-SEM analysis technique was employed by using SmartPLS 3.0 to analyze the final data in order to determine the direct effect of SAIS Service Quality on Student Satisfaction towards FBM-SAIS implementation.

RESULTS

The results of this study will be discussed in two sections: (1) The impact of FBM-SAIS Implementation and (2) The PLS-SEM Analysis on the Direct Effect of SAIS Service Quality on Student Satisfaction towards FBM-SAIS Implementation. All these sections are explained in the following paragraphs.

The Managerial Implications of FBM-SAIS Implementation

As discussed earlier, FBM-SAIS is an online application to manage student activity applications at FBM, UiTM Puncak Alam campus and also to facilitate the Faculty in keeping track and maintaining the record of student activity applications efficiently and effectively. The implementation of FBM-SAIS is in line with the main agenda of UiTM's 11th Malaysia Plan and it also meets the objective of United Nations'

Sustainable Development Goals 12 (SDG 12), which is "Sustainable Consumption and Production". This new system was developed based on the user requirement identified during the interview with the staff from the Student Affairs Office. The results of the interview regarding the managerial implications of FBM-SAIS to the Faculty and user requirements are discussed in the following paragraphs.

a) *Improving the flow of the application submission and approval process*
   Previously, the approval process of student activity application required approximately 16 days. By using the new system (FBM-SAIS), the duration of the application approval was reduced to 7 days as some of the manual processes were eliminated. For instance, FBM-SAIS eliminated the process of students submitting the student activity application form and collecting the approval letter at the Student Affairs Office. Instead, the students were able to do this directly using the online system and at their convenience. Moreover, the Deputy Dean of Student Affairs could complete the approval process by merely retrieving the application from FBM-SAIS.

b) *Effectively manage Faculty student activity information through Database Management System (DBMS)*
   Faculty receives approximately 250 to 450 student activity applications annually. Prior to the implementation of the new system, the staff at the Student Affairs Office had to manually record all the applications and compile the approved activities in Excel software, which was tedious and time consuming. In some cases, the staff also had difficulty locating the files because some of the files were misplaced while others were prone to damage. FBM-SAIS can help the administrators to manage information on student activities effectively and efficiently since the new system is connected to DBMS and the information is retrievable online. In short, everything is at the user's fingertips.

c) *Data retrieval can be done automatically*
   Using the new system, the Head of Learning Department as well as the staff of the Student Affairs Office can classify the student activity application according to the application categories such as community and academic activity. This will help them to do a fast review and

make a better decision regarding budget approval. Moreover, the Deputy Dean of Student Affairs will also be able to manage student activity budget allocation given by the University in a particular year in an effective and efficient manner.

d) *FBM-SAIS meets the objective of UiTM's 11th Malaysia Plan and UN SDG 12*
The main agenda of UiTM's 11th Malaysia Plan states that the transformation of university delivery and innovation ecosystem is important to achieve quality tertiary education. Thus, the implementation of FBM-SAIS is according to the strategic direction of UiTM namely, providing good quality service in education. Moreover, the UN SDG 12 goal is related to the green initiative which is to minimise the usage of paper and to reduce carbon footprint. By developing the FBM-SAIS, achieving 90% of paperless practice is possible since the process of printing the application form and approval is no longer needed.

e) *Increasing staff productivity and reducing cost*
Previously, managing each of the student activity application required approximately 30 minutes. In 2018, 380 applications were received. Based on the above estimate, the time needed to deal with students and to process their applications was approximately 190 hours. With FBM-SAIS, the total hours were reduced to 63. Therefore, this would increase staff productivity at the Faculty. Meanwhile, the cost of paper usage and printing cartridge was also reduced by 93% from the total cost.

FBM-SAIS was developed by using PhP Coding and the new system is focused on four main factors of e-service quality: Ease of Use, Information Quality, Reliability and System Security. The new system has two categories of users, which are students and administrators of FBM. The FBM administrator category are as follows: (1) Head of Learning Department (2) Programme Coordinator (3) Student Affairs Coordinator (4) Deputy Dean of Student Affairs Office and (5) System Administrator. For security purposes, the users must have Student Identification Number or Staff Identification Number for the system to identify them as authorized users. Table 1 shows the requirements for each category of FBM-SAIS users.

Table 1: User Requirements

No	Role	Requirements
1	Student	● The student must have a student ID to login into the system. ● Insert student activity information. ● Submit a student activity application through SAIS. ● View an application status. ● View/print an e-approval letter. ● Upload an application report.
2	Programme Coordinator, Student Affairs Coordinator and Head of Learning Department	● Review student activity application. ● Endorse student activity application. ● Search student activity application by programme, department and activity application category. ● Check student activity application status.
3	Deputy Dean of Student Affairs	● Review student activity application. ● Approve student activity application and total budget given to each activity application. ● Search student activity application by programme, department and activity application category. ● View total budget allocated/used for the student activity in particular year and by programme. ● Print the activity report as per-request.
4	System Administrator	● Print the activity report according to Student Affairs Office needs. ● Insert/Update FBM staff/student information. ● Insert/Update course and programme information for each academic department in FBM.

PLS-SEM Analysis on the Direct Effect of SAIS Service Quality on Student Satisfaction towards FBM-SAIS Implementation

The total number of respondents for quantitative data was 94 respondents. The e-questionnaire was distributed during the final phase of the research to selected students with experience in using FBM-SAIS. Based on the

demographic details, majority of the respondents were female (n = 71) compared to male (n = 23). The majority of the respondents were below 25 years old (n = 90) and the rest were above 25 years old. The results showed that more than half of the respondents were students from semester 1 to semester 3 (n = 49) and the remaining ones (n = 45) were from semester 4 to semester 6. The details of the demographic results are shown in Table 2.

Table 2: Demographic Details

Demographic Item	Frequency	Percentage
Gender		
Male	23	24.47
Female	71	75.53
Age		
Less than 25 years old	90	0.96
More or equal to 25 years old	4	0.04
Semester		
Semester 1 to Semester 3 (Junior)	49	52.10
Semester 4 to Semester 6 (Senior)	45	47.90
Total of Respondents (N):	94	100

Measurement Model

In this study, reflective model and formative model were tested before hypothesis testing. Firstly, the convergent and discriminant analysis for the reflective model was used by assessing the value of Cronbach's Alpha (CA), Composite Reliability (CR) and Average Variance Extracted (AVE) of each item's loadings. The analysis was done by examining the value of item's loadings of each construct and the results showed that all the values exceeded 0.70. Meanwhile, the CR value of each construct was in the range of 0.902 to 0.975 and the CA value was in the range of 0.849 to 0.969. The results showed that all the CA and CR values in this study met the requirements since the values exceeded the recommended value of 0.7 (Hair, Hult, Ringle & Sarstedt, 2017). Besides CA and CR, the AVE value was also important. In this study, the score value of AVE was in the range of 0.666 to 0.915 which exceeded the recommended value of 0.5(Hair *et al.*, 2017). The convergent and discriminant analysis values for reflective

model indicated that the next step of measurement testing could be continued. The overall results of convergent validity for reflective measurement model are shown in Table 3.

Table 3: Convergent Validity for Reflective Measurement Model

First Order Construct	Items	Loadings	CA	CR	AVE
Ease of Use	EOU1	0.922	0.946	0.957	0.789
	EOU2	0.877			
	EOU3	0.840			
	EOU4	0.919			
	EOU5	0.903			
	EOU6	0.868			
Information quality	IQ1	0.937	0.936	0.954	0.839
	IQ2	0.921			
	IQ3	0.883			
	IQ4	0.923			
Reliability	RE1	0.909	0.849	0.909	0.769
	RE2	0.851			
	RE3	0.869			
Security	SEC1	0.908	0.969	0.975	0.867
	SEC2	0.928			
	SEC3	0.939			
	SEC4	0.939			
	SEC5	0.925			
	SEC6	0.945			
Satisfaction	S1	0.951	0.953	0.970	0.915
	S2	0.962			
	S3	0.955			

Secondly, the formative convergent validity for higher-order construct was tested as shown in Table 4. The result for redundancy analysis of path coefficient was 0.625 which was sufficient for an exploratory study (Hair *et al.*, 2017). Moreover, the Variance Inflation Factor (VIF) values for Ease of Use, Information Quality, Reliability and Security were all below the threshold of 5.0 (Hair, Ringle & Sarstedt, 2011). This indicated that all the constructs were free from multicollinearity problem. The outer weight of each formative indicator

was also significant. The overall results of convergent validity for formative model are shown in Table 4.

Table 4: Convergent Validity for Formative Measurement Model

Construct	Items	Convergent Validity	Weight	t-value	VIF
e-Service Quality	Ease of Use	0.625	0.340	17.771	4.055
	Information Quality		0.238	23.119	4.414
	Reliability		0.164	19.579	3.212
	Security		0.352	22.907	3.342

Structural Model

The hypothesis was tested by determining the significance levels of path coefficients which is summarized in Table 5. This study showed that 77.6% of variance (R^2) for student satisfaction towards SAIS implementation was explained by SAIS Service Quality. The hypothesis testing result had shown that there was a positive and significant relationship between SAIS Service Quality ($\beta = 0.881$, *t-value* $= 6.190$, *p-value* < 0.001, *BCI LL* $= 0.284$, *BCI UL* $= 0.600$) and Student Satisfaction towards SAIS implementation. Therefore, this study concluded that hypothesis 1 (H_1) was accepted.

Other than that, the Stone-Geisser approach was used to assess whether the indicated independent variable had a substantive influence on the dependent variable by exploring the effect of f^2. According to Chin, Wynne and Marcoulides (1998), the f^2values of 0.02, 0.15 and 0.35 could be considered to be indicative of small, medium and large effects respectively. The results of the effect size ($f^2 = 0.36$) showed that SAIS Service Quality had a large effect on Student Satisfaction towards the SAIS implementation. Moreover, this study also used an omission distance (D) of 7 to evaluate the predictive validity (Q^2) of the research model. The Q^2 of this study was 0.659, thereby indicating that SAIS Service Quality model in this study was predictively relevant.

Table 5: Result of Hypothesis Testing

Hypo-thesis	Relation-ship	Std Beta (β)	SE	t-value	p-value	R^2	f^2	Q	BCI LL	BCI UL	Result
H1	e-Service Quality -> Student Satisfaction	0.881	0.030	29.617	p < 0.000	0.776	0.36	0.659	2.080	5.655	Accepted

Note: BCI – Bias Confident Interval

DISCUSSION

With the rapid development of the Internet, many institutions have re-innovated the old process into e-process. This e-process will help the institutions to manage records effectively. The Faculty of Business and Management (FBM), UiTM Selangor, Malaysia has taken the initiative to develop FBM-SAIS. This new system provides e-service for the students to submit student activity applications through an online system. Therefore, this study aimed to determine the impact of FBM-SAIS implementation to FBM, UiTM Puncak Alam Campus and to determine the Direct Effect of SAIS Service Quality on Student Satisfaction towards FBM-SAIS Implementation.

This study found that student satisfaction towards FBM-SAIS implementation was strongly affected by SAIS Service Quality. Thus, this study concludes that it is important for Higher Institutions to consider Service Quality when improving their online services in order to increase the rate of customer satisfaction. The website criteria such as Ease of Use, Security, Reliability and Information Quality are important elements that can improve satisfaction among information system users. These findings are in line with the previous studies in e-service field (Farooq, Salam, Fayolle, Jaafar & Ayupp, 2018; Duerte *et al.*, 2018) which showed that e-service quality significantly influenced customer satisfaction.

Additionally, the new system helped to increase FBM staff productivity since the time taken to manage all of the student activity applications and to retrieve the student activities information was reduced from approximately 190 hours to 63 hours. Moreover, the total manpower reduction was 67%. Meanwhile, the cost of paper usage and printing cartridge was reduced by 93%. Thus, this gives a positive financial

implication to the Faculty in terms of cost saving. Furthermore, it also meets the objective of the University to ensure that the Faculty is able to reduce operational costs.

The new development of FBM-SAIS supports 'greenation' highlighted in the United Nation's Sustainable Development Goals (SDG) 12. The concept of 'greenation' is a green initiative practice in the organization. With the implementation of FBM-SAIS, paper usage and printing cartridges are minimised, hence, reducing carbon footprint. In addition, students are not required to be physically present at the Student Affairs Office for application submissions. Instead, they can submit the student activity form and working paper via the Internet, anytime and anywhere.

Managerial Implications

Based on the findings, the current study establishes that FBM-SAIS does have an impact on the managerial aspect of student activities system in the Faculty. The new system helps to improve student activity application submission and approval processes, since all these processes could be done via an online system, anytime and anywhere. In addition, the new system gives a positive financial implication to the Faculty in terms of minimising cost. Moreover, it also meets the objective of the University to ensure that the Faculty is able to lower the operational costs.

This study also shows that SAIS Service Quality significantly influences user satisfaction towards FBM-SAIS implementation. The management of the institution should deliberate heavily on delivering excellent e-service quality since it is essential to enhance customer satisfaction as in this context, students are also customers. Gaining user satisfaction will be a valued advantage to counter competitive challenges in the era of Industrial Revolution 4.0 (IR4.0). In IR4.0, e-service quality is of utmost significance to all industries, including Higher Education institutions to attain a competitive edge, establish customer satisfaction as well as to secure customer loyalty.

Future Research Directions

Future research should explore other appropriate e-service dimensions related to online system development service. This can be done by exploring other appropriate research models and theories related with the e-service area. Due to limited resources and time constraints, this study employed purposive sampling method. However, future studies can address this limitation by using other sampling techniques. Secondly, the sample size for this study was relatively small. Thus, more samples should be retrieved for better results.

CONCLUSION

The rapid growth of the Internet has given opportunities for HE to improve services for their clients and communities (Santos *et al.*, 2020; Aldweeri *et al.*, 2019; Kitsios *et al.*, 2019). Digital transformation technologies have emerged as an increasingly dominant paradigm that must be reckoned with in order to improve organization performance (Teeroovengadum *et al.*, 2019). Therefore, the FBM has taken this initiative to develop FBM-SAIS. This new system provides e-service for the students to submit the student activity application through an online system from anywhere and at anytime and helps to improve the management of student activities system. To ensure the success of its implementation, it was essential for this study to explore the managerial implications of FBM-SAIS to the Faculty and the effect of SAIS e-service quality on student satisfaction towards FBM-SAIS implementation. The study employed both the qualitative and quantitative approach to answer the research questions.

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