The Critical Success Factors of Professional Networking Sites' Adoption by University Students

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Abstract

In today's fast paced digital world, several professional networking sites have grown in quality that offer tremendous amount of knowledge which streamline professionals, entrepreneurs and students with the trending industry. The aim of this research is to analyze the critical success factors of professional networking sites adoption by university students in Malaysia using technology adoption model as a theoretical framework in which students behavioral intentions are assessed against several external factors that are in line with the study. A questionnaire survey was conducted with a sample size of 180 respondents, which was analyzed through SmartPLS structural equation modelling tool. The results showed that students' attitude is the strongest predictor of behavioral intention to use professional networking sites, while self-efficacy, accessibility and subjective norm are the other external effecting factors on behavioral intentions respectively. In contrast, perceived ease of use and perceived usefulness have no direct effect on behavioral intention of students to use professional networking sites. The study makes a valuable contribution in the area of technology and media adoption which can be used as a guideline for organizations as well as for institutions to understand the critical success factors prior to launching a professional networking site specially for university students which is termed as millennials in the study.

I. INTRODUCTION

In today's digital economy, professional networking sites have achieved a significant value among people of all generations. These sites have expanded to both professional and conventional activities that has dramatically changed the way people think [1].Professional networking sites such as LinkedIn, Quora, Xing, FutureLab, Jobcase, and few other community forums have gained traction in recent years. The largest and the most preferred professional networking site 'LinkedIn' possesses over 610 million users in more than 200 countries worldwide [2]. Similarly, 'Xing' as a preferred professional

community forum in European region, acquires about 15.8 million worldwide subscribers [3]. Whereas, 'Quora' is considered among the best online discussion forum specially for professional community serves up to 300 million active users per month [4]. The total number of global social networking users are estimated to rise by 2.9 billion by 2020 [5].The popularity of such sites have been associated with the benefits that it provides to users community, such as; it strengthens relationships by establishing mutual trust, a useful source where new perspectives and ideas are generated by sharing information and experiences. In addition, professional networking sites are a good source for

raising profiles and building professional reputation among industry peers. Moreover, it opens up future career opportunities for young students and professionals. Gaining valuable advice from industry experts is one of the vitals of professional networking.Ultimately, thestudy will evaluate the critical success factors (CSFs) involved in order to maximize the acceptance of Professional Networking Site by university students. For theconcentrated analysis and to acquire the statistical data, university students of Malaysia are selected as a target population for this study.

II. PROFESSIONAL NETWORKING AND STUDENT PERCEPTION

Professional NetworkingSites are community building online platforms that allow users to share knowledge, experiences and explore each other's interests. Professionalnetworkingsites generally evolve around student community as several studies reveal that young students mostly use online networks while they study[6]. Recent researches have discussed that young generation students mostly come to college or university with different tech-gadgets which they normally use for academic and personal purposes [7]. Mastrodicasa and Metellus (2013) came up with a survey that shows students'high preference of using smart devices for academic purposesi.e. 86% students use laptops while 62% prefersaccessing through smartphones and some 15% acquire tablets [8]. This increased use of multiple gadgets by students in recent time clearly means a full-time connectivity through interactive platforms using internet [9]. However, the case is not the same for all as technologically there is a sense of digital divide among students as well as institutions, access to technology varies significantly with race, region, gender and family income [10].

Generally, students these days access professional networking sites through their smart devices rather than on personal home computers. Smith and Caruso (2010) investigated a survey among undergraduate students, found that great number of students look to visit different networking sites and regularly access platforms like Facebook, Twitter and more, as they

are the most preferred microblogging platforms which allow participants to post and update their experiences for extended discussions [11], [12]. Afterall, it is believed that the technology is just an advancing tool for communicating and establishing connections; how efficiently students utilize this tech-tool makes all the difference. Furthermore, Some studies suggest the technological shift as highly useful and positive for students while few others recommend it as a total contrast [13].

Arnold (2011) studied that students participation throughprofessional networking platformsis a positive way of sharing knowledge and learning that mayas well support the long-term institutional goals of engagement and retention [14]. Moreover, Cherry (2018) presents online learning networks asthe relationship of three learning models i.e. live, verbal instructional and symbolic[15].In addition, Minocha (2009) asserted that different networking sites encourage more professional involvement particularly for students and instigate new ways of learning by giving authority to students, provisioning with skills and knowledge, peer-to-peer learning support and enhancing collaborative learning [16]. Ellis, Beyerlein and Apple (2018) shared the same opinion that domain of online learning through networks involves the hierarchy of expertise like; communication, management, teamwork and leadership [17].

III. RESEARCH CONSTRUCTS AND HYPOTHESES DEVELOPMENT

For study objectives, extended TAM 2 model has been adopted from the study of Venkatesh and Davis (2000) and further modified to use as the research baseline model. Since, the extended model combines the social factors and cognitive instrumental determinants into one model [19]. However, in the case of study, the model constructs which will be assessed are specific to the nature of research. Moreover, study hypotheses are developed to establish a theoretical rationale between variables upon the guidance of literature review. The following conceptualization is made in this regard.

A. Behavioral Intention [BI]

In recent time, numerous empirical studies have used various modified versions of the actual TAM model proposed by F. D. Davis (1989) for establishing critical analysis and understanding of the theory, where researchers have certainly used behavioral intention as the main perceived construct to be determined by the primary predictor constructs such as; perceived ease of use and perceived usefulness of an implementing system as well as by the external secondary factors, such as; social norms, facilitating conditions and user personality traits etc. As a matter of fact, numerous empirical theories have consistently reported TAM model that explains a substantial proportion of the variance (typically about 40%) in behavioral intentions of technology users [18]. Similarly, in the study, the adopted theoretical model has been modified where behavioral intention is used as the main principal construct to be explained by the other effecting independent variables of the model.

B. Accessibility [AC]

Accessibility refers to the facilitating conditions and can be defined as the degree of ease and convenience with which an individual accesses the new system [21]. In the context of this research, accessibility will be used as an external factor in the study modelwhere it determines the degree of ease and convenience with which university students can access the professional networking sites on campus. In this regard, university's facilitating resources and innovative environment and the importance of IS gadgets, such as; laptops and smartphones for accessing professional networking sites will be examined [22]. Moreover, in recent time various relevant studies have been conducted by academic practitioners for finding students behavioral intention affected by extrinsic accessibility factor [23], [24]. Likewise, Abdullah (2013)reportedin his study that higher perceived accessibility brings aboutincrease in use of a system or technology [25].

On the basis of above statements, it is believed that the accessibilityfactor will have influence on the behavioral intention of students towards using professional networking sites. Thus,following hypotheses is proposed.

H1 'Accessibility' has a positive effecto towards 'Behavioral Intention' of students to use a Professional Networking Site. [AC → BI]

C. Attitude [AT]

Theoretically, attitude is one of the central construct that identifies the individual's positive or negative approach that reflects a certain behavior towards an adopting system [26]. In the study, it is used as an influential key determinant to find the behavioral intentions of students for using a professional networking site. In recent time, numerous studies have been conducted to explore the significance of attitude towards the use of social networking sites [27]–[29]. Other recent studies have also shown that attitude has a significant influence on behavioral intention to use a new system or technology [30]. Similarly, in the context of study, theoretical perspective of TAM suggests that when an individual perceives that using a professional networking site would enhance his/her career opportunities and give more knowledge, then such user would likely to develop positive attitude towards it. Conversely, users with less positive or pessimistic attitudes would certainly have lower intentions to use professional networking sites.

On the basis of above reasoning, it is believed that the attitude is a crucial determinant in this study tofind the behavioral intention of students toward using PNS. Thus,following hypotheses is proposed.

H2 'Attitude' has a positive effect towards 'Behavioral Intention' of studentsto use a Professional Networking Site. [AT → BI]

D. Perceived Ease of Use [PE]

PE is defined by Davis (1989) as "the degree to which an individual believes that using a particular system would be free of effort" [31, p. 320]. In the context of this study, PE is defined as the individual's perception that using a Professional Networking Site would be free of effort.In addition, many studies both theoretical and empirical have used Perceived Ease of Use (PE) as one of the key determinants for finding user's behavioral intention towards an information system [32]–[35]. Many theoriesonIS studies have developed and modified numerous theory models to examine the adoption process since their

introduction.Likewise, Layla(2014) in her empirical research of online learning platforms evaluated that content design category, site navigation and ease of use feature were the top influential among university students.

On the basis of these findings, it is believed that Perceived Ease of use is important to find the Behavioral Intention of students towards using the PNS. Thus,following hypotheses is proposed.

H3   'Perceived Ease of Use' has a positive effect towards 'Behavioral Intention' of studentsto use a Professional Networking Site. [PE → BI]

E.   Perceived Usefulness [PU]

PU is defined by Davis (1989) as "the degree to which an individual believes that using a particular system would enhance his/her performance[20, p. 320]. In the context of this study, PU is defined as the individual's perception that using a Professional Networking Site would enhance the user performance. Likewise, Venkatesh and Davis (2000)has identified perceived usefulness as an important driving factor of behavioral intention to use an information system. Similarly, many mixed theoriesof technology adoption have found significant relationship between perceived usefulness and behavioral intention to usea technology or an information system [37], [38]. In addition, Rauniar (2014) in his empirical study about social networking sites acceptance have established a positive relationship between perceived usefulness and behavioral intention[29]. Another study conducted by fellow Malaysian researchers confirms the influence of perceived usefulness on behavioral intention for using an online technology application [39].

On the basis of these findings, it is believed that Perceived Usefulness is important tofind the Behavioral Intention of students towards using the PNS. Thus,following hypotheses is proposed.

H4   'Perceived Usefulness' has a positive effect towards 'Behavioral Intention' of studentsto use a Professional Networking Site. [PU → BI]

F.   Self-Efficacy [SE]

The efficiency or effectiveness (self-efficacy) is an intrinsic motivation factor that directly effects the behavioral intention of an individual towards using the new system [40], [41]. Similarly, in the study, self-efficacy works asan independent factor that determines the individual's personal capacity and confidence in using a professional networking site. Furthermore, it measures user skill level of finding desired information and collaborating with mentors on a professional networking site. For instance, when a user believes that he/she possess the required knowledge and competence to use a PNS then it is likely to perceive that the usage is under his/her own control. Thus,self-efficacy is expected to have greater influence on behavioral intention to use a professional networking site. Consequently, it can be said that high efficacy observations will have greater chances of leading towards success in a particular task. However, through the years, numerous related studies have also employed self-efficacy as an external factor of TAM [24], [42].

On the basis of above literature, it is believed that self-efficacy is a defining factor for behavioral intention of students toward using PNS. Thus,following hypotheses is proposed.

H5   'Self-Efficacy' has a positive effect towards 'Behavioral Intention' of studentsto use a Professional Networking Site. [SE → BI]

G.   Subjective Norm [SN]

Subjective norm is incorporated into thisresearch model to identifythe social dimensions in the acceptance process of PNS. Correspondingly, subjective norm is a major social influence variable that determines the perceived societal pressure or community concerns to perform or not to perform a certain behavior[43].Through the years, numerous studies have beenconductedwhere the researchers have found subjective norm as a significant factor that effects the student's intention for usinga new system or technology [24], [44]. Similarly, it was important in the study to examine how social influences effect the behavioral intention or commitment of astudentfor using a professional networking site. For this, SN is usedas a construct to obtain two perspectives for an individual, i.e. social and organizational, where social context means social influence on personal acceptance of PNS use, while organizational   context   focusesonuniversity's

influence or support as an organization fora student to use PNS. In this way, higher perceived expectations from the acquaintances would result in a stronger subjective norm, which will affect the intention of a user to perform that behavior[45], [46].

On the basis of above literature and provided reasoning, following hypotheses is proposed.

H6 'Subjective Norm' has a positive effect towards 'Behavioral Intention' of studentsto use a Professional Networking Site. [SN → BI]
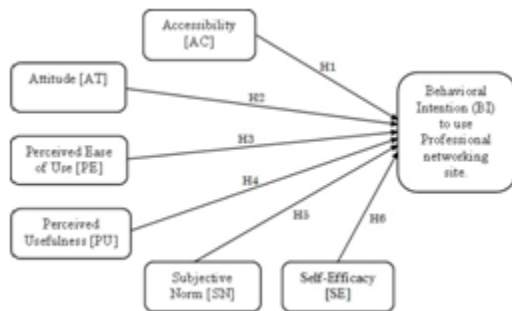
IV. CONCEPTUAL MODEL

Figure 1: Conceptual Model

V. RESEARCH METHOD

Quantitative research has earned so much trust of number of researchers and academicians worldwide. The research approach of this study is aimed to use statistical data which will be derived according to the conceptual framework of the research. Later, the obtained statistical data will work as an evidence for documenting results and further research analysis. The research approach for this study will be deduction based. Since, the deductive approach requires large data samples for generalization purpose, so the results obtained from the study will be used as a generalized sample to represent the student community of Malaysia. Furthermore, convenience sampling technique has been used to collect data information as the technique is highly preferred by various researchers for quantitative studies. Convenience sampling is a type of non-probability sampling where respondents can be selected based on their easy accessibility and willingness to fill-up the survey questionnaires [47]. Since, the target population of this research is fixed

and clearly defined, therefore, the respondents can be any student from a Malaysian university and is estimated to be around 200 respondents. In this way, a survey questionnaire was distributed carefully among the target population for sample generalization purpose.

A. Instrument Design

The survey instrument was comprised on 3 sections. First section had a brief elaboration of informed consent describing about the research topic, the value of participation, addressing concerns about respondent identity protection and author's profile information. Second section contained the demographic information, in which respondent is required to be a user of any professional networking site in order to continue the survey. Additionally, the section has questions about years of using professional networking sites, preferred professional networking site, weekly usage frequency, name of institution, highest qualification, age and gender. Third section was divided into seven sub sections according to the adopted model specifying the research variables that comprised on number of items/questions for each variable construct. Likert-scale measurement was used with each item for obtaining accuracy in results.

B. Partial Least Square Structured Equation Modelling [PLS-SEM]

PLS-SEM is considered the most suitable tool for making predictions and exploratory modelling such as in this research. The major advantage of using PLS is that it models multiple dependents as well as multiple independents and the chance to properly address multicollinearity between independent variables [48].

In this study, SmartPLS version 3.2.8 is used to assess the uni-dimensionality, validity and reliability of the research model constructs. Since, confirmatory factor analysis (CFA) is normally used with a multivariate statistical procedure to identify whether the variables examined represent the constructs for the model [49]. Similarly in this study, CFA is used to confirm the validity of the measurement scale, to test the hypotheses and to determine the validity of

the cause and effect relationship between the variables.

VI. RESPONDENTS' CHARACTERISTICS

The first stage of this research examined the characteristics of the respondents who participated in the survey. This is done with a view of understanding the background of those who participated as well as to validate the suitability of the respondents to the nature of this research. The survey explored two main components, namely the demographic profile of the participants and their professional networking sites usage profile.

A. An overview of the respondents' characteristics

A total of 385 surveys were distributed to targeted participants comprising of university students. The survey responses for this study have reached the total of 180 responses out of which 10 were discarded due to respondents answering 'NO' to the mandatory dichotomous question that explored if the respondents are the users of any professional networking site. This led to a final response rate of 44 percent (i.e. 170/385).

In the study, 98.8% respondents are students, however few exceptions were made for faculty and staff participants i.e. 1.17%. Subsequently, majority of the respondents are from "Asia Pacific University" i.e. 83.5%, whereas some responses about 16.4% of the total sample were collected from the students of "University Putra Malaysia". This infers that the sample represent the targeted audience of university students as millennials.

B. Preferred Professional Networking Site

In the questionnaire, the respondents were given some of the popular professional networking sites. Thereby, the response results show that by far the most popular and preferred PNS among the millennials turned out to be the LinkedIn, as majority of the students i.e. 74.7% have opted for it as their most preferred professional networking site. However, other popular sites of such nature includes: Quora and FutureLab also scored 12.4% and 10% respectively. Such dominancy of LinkedIn

emphasizes on the need for certain improvements for other PNS providers who should look to work on creating new ways to increase penetration among the millennials.

C. Years of using Professional Networking Site

The students who participated in the survey were well aware and had the basic knowledge of professional networking sites, as majority of participants around 38.8% were found using such sites from 1 – 3 years. However, more than 25% of the respondents can be considered as expert users of professional networking sites, since they have been using such site(s) for more than 3 years.

D. Gender

In the survey, male students who participated were more in number i.e. 60% than female students who acquires 40% of the total sample size. This 60/40 ratio between the respondents' gender reflects the researcher's unbiased intention to capture the overall neutral perspective of students towards using professional networking sites.

E. Age Group

Since the survey was conducted at the university level particularly for students, therefore, majority of the respondents i.e. 50.6 % belong to the age group of 18-25. Whereas, the age group of 26-32 also acquires the second highest population in this study i.e. 36.1%, which indicates that the targeted audience were young students who may look to pursue career guidance and counselling in near future. As a matter of fact, securing the views of such age group is useful as it fits with the nature of this research which examines the benefits of online professional networking for millennials. On the other hand, more than 4% of respondents were in the age group of 41 – 50 that shows some of the respondents were senior students who may be pursuing their PhDs.

F. Highest Qualification

Majority of respondents were the Masterdegree students i.e. 45.9%. Also, the degree students were quite in number i.e. 31.2%. Moreover, some 7% respondents were PhD holders. Thus, this high qualification of respondents indicate that the audience for this research was highly educated and so

would be able to comprehend the issues being explored through the survey. Hence, the knowledge that they share would constitute a valid perspective.

G. Usage Frequency of Professional Networking Account

The results reveal that majority of respondents i.e. 61.1% of the total sample size access their professional networking accounts once in a week. Whereas, only about 6.5% respondents use their professional accounts daily. Such statistic is a clear illustration of millennials attitude towards professional networking sites, which indicates that the university students were overall less attracted by the professional networking sites, thus necessary measures are required to enhance their use intentions.

VII.   PARTIAL LEAST SQUARE ANALYSIS

Partial least square (PLS) analysis is acovariance-based structural equation modeling (SEM) used for evaluation of the latent variables in the model. It can also be referred as "component-based SEM" that investigates the correlation between dependent and independent variables [48]. PLS has characteristics which are most suitable with studies that require predictions or exploratory analysis. In this section, the extracted dataset in SmartPLS 3 has been explored for analysis comprising on outer and inner path measurement models. In outer model assessment, reflective constructs are measured for their indicators reliability and validity using PLS-Algorithm procedure. While for evaluation of the structural model, the variables are tested for their predictive relevance, path significance and goodness of fit. In the end, hypotheses between the latent variables are tested.

A.   Outer Model Assessment

In reflective or outer model measurement, Confirmatory Factor Analysis (CFA) is done to examine the reflective constructs and their measured indicators.SmartPLS 3 has been used to determine the required factors which are more effective in the data and the relationship between variables which further confirms or rejects the measurement theory [50]. Initially, for outer model assessment, PLS-Algorithm procedure is applied to measure the

Indicators reliability, Internal consistency reliability, convergent validity and discriminant validity of the reflective constructs.

1.   Indicator Item Reliability

Measurement of indicator reliability is very crucial in the reflective model as it indicates the validity of the developed instrument for the study [51]. Some studies have recommended that factor loadings for each construct should be equal to or greater than 0.7 [52], [53]. However for exploratory studies, researchers have also accepted factor loadings of 0.6 and above [54], [55]. Thereby, for the confirmatory factor analysis the indicators which have scores below 0.6 should be excluded from the model. Similarly in our developed instrument, total 29 indicators were used for analysis. Whereby, 2 items were found having scores lower than threshold value of 0.6, therefore those 2 item indicators were excluded from the model to obtain good overall factor reliability and to ensure error-free endogenous construct.

2.   Internal Consistency Reliability

To test the internal consistency reliability of the model "Cronbach's alpha" is used specially with social science studies. However, due to more conservative measurement values of "α", many researchers have suggested to use "composite reliability" as a replacement where the value of CR is slightly higher and more reliable than Cronbach Alpha with relatively negligible difference [53], [56]. Moreover, composite reliability (CR) identifies the likelihood of the model to predict intentions in the latent variables and also eliminates the issue of repetition of items [57]. Notably, the threshold value for CR helps in eliminating the ineffective variables that have lower reliability and consistency. In the context of this study, the CR value for each variable was measured as above 0.8, which shows that internal consistency reliability was higher for each construct in this model.

3.   Convergent Validity

The assessment of convergent validity of the model can be defined as the degree to which where each construct is explained by its indicator items' variance which is termed as "Average Variance Extracted" [58]. Theoretically, convergent validity is assessed by

measuring AVE for each indicator associated with the constructs and is also referred as communality of construct [59], where the value of AVE is the mean of squared loadings of each construct. Many previous studies have used the acceptable threshold value for AVE as 0.5 or above, which means that the construct explains 50% or more of the variances of its indicator items [53]. In thestudy, the value of AVE for each construct has achieved the required threshold of 0.5 which confirms the convergent validity of this model. The below table presents the summary of measured readings.

Table 1: Summary of Construct reliability and validity

Model Construct	Loadings	Cronbach's Alpha	Composite Reliability	AVE
Accessibility [AC]		0.786	0.862	0.610
AC1	0.805			
AC2	0.814			
AC3	0.787			
AC4	0.716			
Attitude [AT]		0.870	0.901	0.603
AT1	0.736			
AT2	0.736			
AT3	0.788			
AT4	0.815			
AT5	0.779			
AT6	0.803			
Behavioral Intention [BI]		0.813	0.889	0.727
BI1	0.846			
BI2	0.879			
BI3	0.832			
Perceive Ease of use [PE]		0.838	0.895	0.685
PE1	0.901			
PE2	0.902			
PE3	0.849			
PE4	0.628			
Perceive Usefulness [PU]		0.883	0.914	0.682
PU1	0.752			
PU2	0.864			

PU3	0.870			
PU4	0.838			
PU5	0.797			
Self-Efficacy [SE]		0.810	0.887	0.723
SE1	0.863			
SE2	0.829			
SE3	0.858			
Subjective Norm [SN]		0.808	0.887	0.723
SN1	0.893			
SN2	0.875			
SN3	0.780			

4. Discriminant Validity

The last part of outer measurement model is the assessment of discriminant validity, which can be defined as the degree to which where one construct is empirically distinct from all other constructs [53]. In other words, it is used to test whether the construct measures what it is intended to measure. According to past studies, one method for assessing the discriminant validity is through Fornell and Larcker (1981) criterion, which states that the square root of AVE for each construct should be higher than its correlation values with all other constructs [60]. Similarly in the study, the reflective model fulfils the Fonell-Larcker

criterion, where the square root values of AVE for each construct were analyzed and found greater than other 6 correlation values.

Another useful method employed by academic practitioners for assessing the discriminant validity is to measure the cross loadings of each construct, wherethe indicators' outer loadings of one constructshould be higher than cross loadings withall other constructs[61]. Evidently, the condition for second method was also satisfied while evaluating the outer reflective model (see table 3).

Table 2: Fornell-Larcker Criterion

	AC	AT	BI	PE	PU	SE	SN
AC	0.781						
AT	0.638	0.777					
BI	0.622	0.714	0.853				
PE	0.456	0.652	0.536	0.828			
PU	0.442	0.663	0.588	0.534	0.826		
SE	0.539	0.614	0.631	0.598	0.466	0.850	
SN	0.587	0.695	0.648	0.431	0.553	0.580	0.851

Table 3: Cross Loadings

	AC	AT	BI	PE	PU	SE	SN
AC1	0.805	0.515	0.512	0.401	0.344	0.443	0.506
AC2	0.814	0.453	0.503	0.250	0.313	0.378	0.363
AC3	0.787	0.550	0.459	0.502	0.288	0.491	0.507
AC4	0.716	0.479	0.464	0.279	0.440	0.374	0.462
AT1	0.403	0.736	0.382	0.540	0.535	0.380	0.514
AT2	0.357	0.736	0.454	0.516	0.424	0.451	0.501
AT3	0.503	0.788	0.645	0.472	0.557	0.511	0.553
AT4	0.565	0.815	0.544	0.422	0.514	0.440	0.549
AT5	0.493	0.779	0.560	0.550	0.581	0.494	0.549
AT6	0.594	0.803	0.654	0.557	0.481	0.544	0.569
BI1	0.504	0.592	0.846	0.418	0.555	0.520	0.441
BI2	0.485	0.559	0.879	0.386	0.476	0.540	0.567
BI3	0.591	0.667	0.832	0.555	0.474	0.552	0.637
PE1	0.404	0.612	0.480	0.901	0.468	0.496	0.415
PE2	0.356	0.601	0.478	0.902	0.521	0.498	0.371
PE3	0.348	0.506	0.409	0.849	0.440	0.548	0.369
PE4	0.402	0.412	0.395	0.628	0.316	0.438	0.258
PU1	0.289	0.456	0.397	0.448	0.752	0.349	0.380
PU2	0.408	0.565	0.523	0.432	0.864	0.367	0.446
PU3	0.346	0.527	0.525	0.401	0.870	0.350	0.408
PU4	0.402	0.598	0.521	0.505	0.838	0.448	0.550
PU5	0.371	0.586	0.442	0.426	0.797	0.413	0.498
SE1	0.427	0.508	0.510	0.496	0.412	0.863	0.459
SE2	0.438	0.526	0.467	0.607	0.373	0.829	0.451
SE3	0.500	0.531	0.613	0.446	0.402	0.858	0.555
SN1	0.544	0.662	0.596	0.444	0.539	0.556	0.893
SN2	0.514	0.615	0.579	0.446	0.469	0.535	0.875
SN3	0.430	0.482	0.469	0.177	0.393	0.371	0.780

B. Structural Model Assessment

The next stage is to assess the structural model which is also referred as inner path model. In this stage, the relationship strength between the endogenous construct and all effecting exogenous constructs will be thoroughly examined. Initially, the latent variables are evaluated for any possible collinearity issues in between them by performing PLS-Algorithm procedure in SmartPLS 3. Primarily, the focus of this staged assessment is on learning about the predictive capabilities of the model, where several tests will be performed to determine the goodness of model fit and to test the research hypotheses.

1. Multicollinearity

Prior to structural assessment, the inner model needs to be tested for potential collinearity or similarity issues between its endogenous and exogenous variables. Since, such issues are subject to bias results if the constructs are found highly correlated. However, earlier used Fornell-Larckercriterionis alsoconsidered to revealany correlation issues between the constructs [51]. Subsequently, multi-collinearity were tested in the model by performing PLS-Algorithm procedure, where values of variance inflation factor (VIF) are measured. According to the rule of thumb, predictor variables having VIF scores above 5 are indicative of collinearity issues between them [62]. In the study, VIF values of all predictor variables are observed well under the threshold level i.e.<5, which reveals that there is no multicollinearity issues exist in the model.

Table 4: Inner VIF values of predictors

	AC	AT	PE	PU	SE	SN
BI	1.87	3.38	2.06	1.90	2.03	2.30

2. Coefficient of determination (R²)

The coefficient of determination is a measure of predictive accuracy in the model that indicates the overall variance explained in the endogenous construct. It is represented by the combined effect of exogeneous variables on the endogenous variable(s) of the model [63]. According to the rule of thumb, the standard range for R^2 is from 0 to 1, where higher values represent strong predictive accuracy. Thus, values such as 0.25, 0.50 & 0.75 can be described as weak, moderate and strong levels of predictive accuracy for the construct, respectively. While in the study, value for R^2 is calculated as 0.623 by using

PLS-Algorithm, which can be interpreted as the primary endogenous construct (BI) has almost strong predictive accuracy or higher level of variances explained by all exogenous constructs.

Table 5: Coefficient of determination (R²)

Construct	R Square	R Square Adjusted
Behavioral Intention [BI]	0.623	0.610

3. Predictive Relevance (Q²)

Another way to assess predictive accuracy of the hypothesized constructs is to calculate the Q^2 value of the endogenous construct by performing blindfolding procedure. In this technique, the tool omits single point in the given data matrix, imputes it and estimates the model parameters [64]. The sequence of data points for omission is determined by the researcher as an omission distance, the value of which should be in between 5 – 12 preferably 7 depending on the sample size [64]. In this way, the process repeats itself until every sequential point in the data matrix of the selected construct is omitted, these omitted points are estimated and used to predict Q^2 value. For endogenous construct, Q^2 value greater than '0' reveals good predictive relevance and vice-versa. Similarly, small difference between the original and predicted values means higher Q^2 criterion and thus more predictive relevance [58]. Furthermore, there are two statistical measures of Q^2 i.e. crossvalidated redundancy and crossvalidated communality. However, based on literature cv-redundancy is recommended for assessing the predictive relevance of the construct [53]. In the study, the value for construct crossvalidated redundancy is observed as 0.405, which indicates higher predictive power of the main construct.

Table 6: Crossvalidated Redundancy (Q²)

Construct	CV-Redundancy
Behavioral Intention [BI]	0.405

4. Model fit Assessment

Assessment of model fit is used to verify that whether the established study model sufficiently explains the empirical data or not [65]. However, from previous studies it has been observed that for small sample

data sets, chi-square value is normally measured to assess the fitness of the model [66]. Whereas, for datasets of sample size 200 or more, values of standardized root mean square residual (SRMR) which is an index of residuals among the observed and estimated covariance matrices, and values of normed fit index (NFI) whichindicates an incremental fit measure are assessed [67]. Similarly, the sample size of this study is of larger measure and also the questionnaire was comprised on same scaled items, therefore, values of SRMR and NFI are measured to reach the outcome of the model fit estimation [68]. The threshold criteria for a fit model is: SRMR $\leq$ 0.08 and NFI ranges from 0 to 1,wherevalues closer to 0.95 indicate a good fit[69], [70]. For the study model, the obtained results were within the acceptable range (see table 7) which showsthat the model is fit and further analysis can be carried out.

Table 7: Model Fit

Fit Index	Results	Acceptable limit	Assessment
SRMR	0.078	$\leq$ 0.08 [70]	Acceptable fit
NFI	0.708	0 – 1 [69]	Acceptable fit

Table 8: Path coefficient and Significance

Hypothesized Relationship	Path Coefficients	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
AC » BI	0.185	0.206	0.093	2.030	0.048
AT » BI	0.252	0.243	0.101	2.483	0.013
PE » BI	0.018	0.005	0.073	0.252	0.801
PU » BI	0.146	0.160	0.105	1.392	0.164
SE » BI	0.208	0.200	0.088	2.377	0.017
SN » BI	0.155	0.148	0.077	2.012	0.044

The results fromthe bootstrapping procedure reveals that the four out of six construct relationships are significant (see table 8). Where (PE -> BI) & (PU -> BI) are measured as insignificant in the study model, these results are further analyzed in the next section of hypotheses testing.

5. Path Coefficient and Significance

The path coefficients in the model represent the relationship strength between the constructs. In the established model, the connecting links indicated by statistical values are path coefficients that represent the hypothesized relationships between constructs[71]. The standard range for path coefficient values are from -1 to +1, where values closeto +1 will reflect positive relationship and values close to -1 will reflect negative relationship between the constructs. In the study, all of the affecting variables are observed as having positive relationship with the dependent variable since path-coefficient values for all variables are positive. Although in most cases, if the coefficient values lie within the standard range then constructs are also considered significant[72]. However, the significance between constructs must also be assessed by using bootstrapping procedure where T-statistics and P-values are used for estimating the hypothesized relationship of constructs.Thereby, using a two-tailed t-test with a significance level of 5%, the path relationship between constructs is considered significant if the value for T-statistic > 1.96 at p < 0.05** [51].

C. Hypotheses Testing

In this section, the earlier developed hypotheses in the study will be examined using the standard regression coefficient analysis where the values of t-statistics and p-values are assessed for hypotheses validation. Thereby, the condition for endorsing the

hypothesized relationship of constructs is that: t-statistics > 2.58 are significant at p < 0.01** or t-statistics > 1.96 are significant at p < 0.05** or t-statistics > 1.645 are significant at p < 0.10*. The above table 8 presents the results of hypothesized constructs, which will be used for testing the hypotheses.

H1: [AC → BI]'Accessibility' is obtained as a significant factor that has a positive effect towards 'Behavioral Intention' for using a Professional Networking Site (β=0.185; t=2.030; p=0.048). The results can be interpreted as; effortless accessibility would create good intentions and encourage more students to use professional networking sites to a greater extent. The findings are consistent with the study of Salloum and Shaalan (2018) in which they have concluded that accessibility measures will significantly improve the adoption rate among students.

H2: [AT → BI]'Attitude' is also measured as a significant factor that has a positive effect towards 'Behavioral Intention' for using a Professional Networking Site (β=0.252; t=2.483; p=0.013). The results can be interpreted as; the student's attitude that reflects personal viewpoint and beliefs are strongly associated with the individual's intention for using a professional networking site. In other words, the students with the optimistic attitudes will tend to use professional networking sites more or vice versa. The findings are consistent with the recent study of Tan (2019) where he found that the learning attitudes of students will positively affect the intention to use e-tutoring websites.

H3: [PE → BI]'Perceive Ease of use' is calculated as a not significant factor with a very small positive effect towards the 'Behavioral Intention' for using professional networking sites (β=0.018; t=0.252; p=0.801).The statistically non-significant results show that the hypotheses H3 is not supported in the study. Such that, the findings are contrast to many existing theories of such nature where perceived ease

of use was considered as one of the major determinants to extract the usage intention [33]–[35].

H4: [PU → BI]'Perceive Usefulness' is also obtained as a not significant factor which has a small positive relationship with 'Behavioral Intention' for using professional networking sites (β=0.146; t=1.392; p=0.164). The statistically non-significant results show that the hypotheses H4 is also not supported in the study.The findings are contrast to many existing theories of such nature where perceived usefulness was found as an important driving factor of behavioral intention to use the new system or technology [29], [37], [38].

H5: [SE → BI]'Self-Efficacy' is measured as a significant factor thathas a positive effect towards 'Behavioral Intention' for using a Professional Networking Site (β=0.208; t=2.377; p=0.017). The results can be further interpreted as; the students who feel technically equipped or confident with their skills for using professional networking sites will spend more time utilizing such sites and will tend to increase their usage frequency more.The findings are consistent with the recent study conducted in Malaysia, where the researchers have concluded self-efficacy as an effective determinant to explain the behavioral intentions of technology adopters [39].

H6: [SN → BI]'Subjective Norm'is obtained as a significant factor thathas a positive effect towards 'Behavioral Intention' for using a Professional Networking Site (β=0.155; t=2.012; p=0.044). The results can be interpreted as; the students intentions of using professional networking sites are strongly driven by societal norms or community concerns, which means that this digitally equipped and fast paced society positively influence students' intentions to increase the use of professional networking sites. The findings are in line with the study of Al-Gahtani (2016) in which he deduced that 'subjective norm' is an influential factor that derives students' intentions to use an e-learning system.

Table 9: Hypotheses results summary

SNo.	Hypotheses	Findings
H1	'Accessibility' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [AC → BI]	Supported
H2	'Attitude' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [AT → BI]	Supported
H3	'Perceived Ease of Use' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [PE → BI]	Not supported
H4	'Perceived Usefulness' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [PU → BI]	Not supported
H5	'Self-Efficacy' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [SE → BI]	Supported
H6	'Subjective Norm' has a positive effect towards 'Behavioral Intention' of students for using a Professional Networking Site. [SN → BI]	Supported

Overall findings of the research revealed that the hypotheses H1, H2, H5 and H6 are supported in the study. Such that, the independent variables in the model i.e. accessibility, attitude, self-efficacy and subjective norm are significant and have a positive effect on behavioral intentions of millennials in Malaysia for using professional networking sites. The hypotheses that are not supported bring validation and novelty in the study, while the supported ones provide valuable conclusions for future references. A summary of critical success factors is given as under:

Table 10: Summary of Critical Success Factors

Critical Success Factors	Study assessment	Findings
Attitude of university students	Personal perception of students for using professional networking sites.	✓ Self-motivated students will have high use intentions. ✓ Ones who like sharing knowledge and experiences online. ✓ Students who like maintaining professional image online. ✓ Who enjoy online engagements with peers. ✓ Satisfied & loyal subscribers tend to use professional networking sites more.

Self-Efficacy of university students	Personal competency level of students for handling professional networking sites.	✓ Students who feel confident on their skills. ✓ Ones who consider themselves capable of handling website complexities well. ✓ Confident communicators. ✓ Frequent users have high confidence level for handling professional networking sites.
Accessibility conditions for university students	Access barriers and resources that may be utilized for maximizing the acceptance of professional networking sites.	✓ Campus high internet bandwidth is a must. ✓ Respondents had the luxury of modern-day campus facilities. ✓ Constant connectivity made possible using smartphones and laptops. ✓ Sustainable remote access or offline usage is a cognitive concern for site implementors. ✓ Implementors should look to simplify App design interface for frequent android users.
Subjective Norm perceived by university students.	Dominant pressures of society and environment within institutions for adopting professional networking sites.	✓ Students' usage intentions are dominated by the competent society. ✓ University students in Malaysia generally have innovative and encouraging campus environments.

VIII.   PROPOSED RESEARCH MODEL
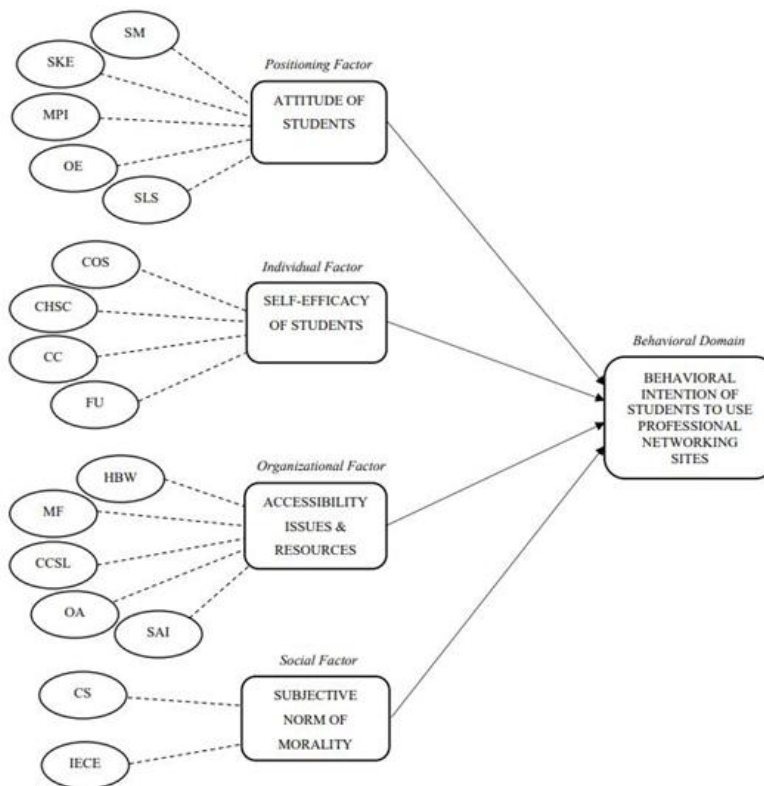
Table 1: Legends

SM – Self Motivated.	FU – Frequent Users.
SKE – Sharing Knowledge & Experience.	HBW – High Bandwidth.
MPI – Maintaining Professional Image.	MF – Modern-day Facilities.
OE – Online Engagements.	CCSL – Constant Connectivity via Smartphones & Laptops.
SLS – Satisfied & Loyal Subscribers.	OA – Offline Access.
COS – Confident on Skills.	SAI – Simplified App Interface.
CHSC – Capable of Handling Site Complexities.	CS – Competent Society.
CC – Confident Communicators.	IECE – Innovative & Encouraging Campus Environment.

IX.   STUDY IMPLICATIONS

The final results of the study have categorically identified the principle critical success factors that need to be considered by an organization when looking to introduce a professional networking site for university students in Malaysia. Subsequently, there are in line practical implications of the study that need to be contemplated as well by the implementers to maximize the acceptance among students. The implications are extracted from supported hypotheses in study which were used as an aid to formulate the critical success factors.

A.   Unfold positivity in millennials' attitudes

In the study, students' positive attitude is the most defining factor for enhancing the use of professional networking sites which is in line with the latest study of Tan (2019) that says students with optimistic attitudes will have high intentions to use e-tutoring websites. Therefore, PNS implementors should look to unfold positivity in millennials' attitudes by winning their trust and confidence, which as an indication can be achieved by rewarding the loyal or satisfied users of the website with premium discounted offers, free subscriptions for newsletters as well as extra visibility in a job search and more cases like these [74]. Consequently, the valued user would be more fascinated by the remunerations, thus feel pleased and rewarded and may even recommend the site to their friends.

B.   Uplift technical credibility of students

In the study, self-efficacy of students was obtained as an important determinant for finding user acceptance of professional networking sites, where technically sound students were found as the most frequent users of professional networking sites that simply justifies the study of Constantinides *et al.*(2013), where self-efficacy was achieved as an intrinsic motivation factor that drastically raises usage intentions.

Therefore, it is essential for PNS implementors to work on uplifting the technical credibility of students for smooth navigation through the site to enhance their user experience and exploit the massive gains of these professional networking sites [75], which as a proposition can be achieved by conducting post-implementation training workshops, tutorial sessions in campus, as well as working in collaboration with students in the form of organizing campaigns that personalize their site experience.

C.   Provide offline access through simplified App content

Accessibility conditions was identified as the most pragmatic factor in the study where fair amount of executions can simply raise the acceptance rate of professional networking sites among students [23]. In the study, access barriers and offset resources were assessed in conjunction, where maintaining accessibility in remote areas as well as provisioning offline media access for maximum usage scenario were obtained as workable concerns for PNS implementers. Such that, these concerns can be ideally addressed by ensuring high internet bandwidth inside campus for constant connectivity through smartphones or laptops, as well as working on simplifying web content design interface in a way for a swift user experience for android users which can be accessed through offline media App [76]. Eventually, implications like these will ease-up site accessibility and cause significant increase in the use of professional networking sites among students.

D.   Spread supplementary awareness

Subjective norm reflected the social dimensions of study, where students usage intentions of professional networking sites were found highly influenced by the competent society and the encouraging campus environments [44]. Such that, this dominancy of surrounding social influence on students' use perception can be further maximized if PNS

implementors yield supplementary measures for outspreading more awareness about the far-reaching benefits of professional networking sites within campus and in societyby participating in educational events and retrospective exhibitions, which will certainly construct direct influence on students' usage intentions.

X. LIMITATIONS AND FUTURE DIRECTIONS

The empirical study has persuasively demonstrated the relationship between critical success factors required for an organization and university students' attitude towards professional networking sites based on an adopted theoretical model. However, the research is subjected to some methodological limitations and future directions. The first and primary limitation is its cross-sectional design due to limited time span allocated for study that involved data administration, analysis of results and drawing conclusions from the findings. Such that, a longitudinal study in this case could provide more evidences of causal results and greater predictive ability. Second, the research survey conducted was limited to only 2 well reputed universities of Kuala Lumpur-Malaysia, where the target participants were young students. Therefore, it could be inferred that the sample size may not be an exact representation, therefore, to strengthen the validity of model constructs, a future research can be done with cross-national sample population comprising on different age groups where senior professionals can also be sampled.

Theoretically, the conceptual model of the study is based on extended TAM 2 model that has been restructured after consideration to eliminate the evaluation of any mediation effect in the study and look to investigate only the direct relations between model constructs. Although, other technology adoption theories, such as; UTAUT, DOI, TRA, TPB, TOE and few more can also be adopted with such type of study. Furthermore, future researchers can also include more variables as mediator or external predictors to extract respondent's usage intentions. Since, few variables in study model have limited number of indicator items i.e. 3 statements, which in some cases may result in bias responses and show less reliability of scales [77]. Thus, future researches can use more indicator items with predictor constructs to enhance the reliability of scales and overall predictability of the model.

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