Investigation of perceived security, privacy and trust on social networking sites for stakeholder relationships development in Malaysian universities

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Abstract: Social networking sites (SNSs) are the major technological developments included under the umbrella of Web 2.0. College students are the most frequent users among the billion of active SNSs participants. Despite the many advantages that derived from active participation in SNSs, numerous security, privacy and trust concerns seem to influence social interactions and communications within it. The purpose of this quantitative research study was to determine the impact of security, privacy, and trust concerns on members' behaviour towards sharing their information and develop new relationships using a survey method in the form of a questionnaire. Furthermore, this study examined the effects of the relationships developments between students on the prospective students' enrollment and potential employees' application in Malaysian higher education institutions (HEIs). The findings of the study showed that perceived privacy and security are still to be the slight concerns for online SNSs' users' willingness to share their information. However, members' perceived security, trust in SNSs and its members positively associated with development of new relationships, which is positively associated with students' enrollment and employees' application in HEIs. The findings provided descriptive, reliability, factors loading, correlations as well as regression analyses for perspectives, using SPSS 12.0.

Keywords: perceived security; perceived privacy; perceived trust; information sharing; higher education institutions; social networking sites; SNSs.

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1 Introduction

Social media (SM) is one of the major technological developments stemming from Web 2.0 (Squicciarini et al., 2010) as an increasingly powerful force in mediated communication. It has shown strong growth since it first appeared in 1995. Currently, there are more than 200 different SM sites with more than one billion active users (FaceBook, 2012). As a result of the huge amount of users' participation and interaction, seven SM sites in the top 20 websites as shown in Table 1 (Alexa, 2012).

Social networking sites (SNSs) are one aspect of SM, where individuals can present themselves with an online profile, with ways to display profile information, share ideas, interests, or are looking to meet people with similar ideas and interests. Almost in all user communities, SNSs have become increasingly widespread over the past decade, (Chinaei et al., 2012). Within Malaysia, more than 13 millions of citizens are actively using FaceBook, the most popular social network. According to Socialbaker Statistics (2012), those users are 50.29% compared to the country's population and 77.84% in relation to

number of internet users. In 2012, Malaysia is ranked the 18th country in the world in terms of FaceBook users.

Table 1 Top websites in the web based on internet traffic as reported by Alexa on August 8, 2012

Rank	*Site*	*Rank*	*Site*
1	Google.com	11	*Blogspot.com*
2	*FaceBook.com*	12	Google India
3	*YouTube*	13	*LinkedIn*
4	Yahoo	14	TaoBao.com
5	Baidu	15	sina.com.cn
6	*Wikipedia*	16	Yahoo Japan
7	Windows Live	17	MSN
8	*Twitter*	18	google.com.hk
9	QQ.com	19	google.de
10	Amazon.com	20	*wordpress.com*

Higher education is facing big challenges nowadays, which have made a lot of higher education institutions (HEIs) interested in attracting more students and excellent staff. In fact, the rapid growth of SM has changed the way HEIs communicate. Today's college students, 'the most wired in history', have woven technology into their everyday life for communication, connection, and engagement. They use the internet, e-mail, SNSs, instant messaging, blogs at higher rates than the rest of individuals from any other generation. They rarely differentiate between real-world and online communication (Hrastinski and Aghaee, 2012; Jones, 2002; Junco and Mastrodicasa, 2007; Junco and Cole-Avent, 2008; Jones et al., 2009). The emergence of SNSs has created opportunities for students to establish relationships with other students prior to their arriving on campus in ways that may not have been previously possible. Indeed, SNSs are being developed by universities to increase connections among students, faculty, and staff (Kaya, 2010). Consequently, SNSs with their possibilities to communicate, reflect, and collaborate, may function to improve the relationships between stockholders which will affect the students' enrollment and employees applications to the university.

Despite the SNSs possibilities, it faces a number of challenges included privacy, security, and trust concerns. As SNSs become more and more popular, they may be one place on the internet where users feel more secure and private than they actually are. People may expect a level of privacy from SNSs that is not realistic. Or, they may trust the online community and believe that its privacy policy protects their information from stranger. Undoubtedly, the more that people feel their security, privacy is protected; the more they are willing to share and make new relationships.

Many people view SNSs as private profiles and are willing to display personal information such as their name, address, personal photos, and other contact information. Because the users view their pages as private, they would not expect the information posted to be viewed by the general public. Since SNSs security and privacy is harder to guarantee, does a higher level of concern for internet security and privacy affect the use of SNSs? Is it possible to join a network of millions of people and be able to trust all of

them? Since people are obviously joining networks and revealing information, what role does trust play in the use of social networking sites?

The present study aims at identifying the factors that influence Malaysian HEIs' students' willingness to share information and develop new relationships within the SNSs. The new relationships are considered to be influencing the prospective students' enrollments as well potential employees' application to the HEIs. For that reason, this study aims at examining the impact of security and privacy concerns, trust of SNSs and its members, on students' activities in SNSs. The majority of prior academic studies focus on one site, whereas this study applies the same measures of concern for security, privacy and trust to users of different SNSs. This study is carried out in answering the research questions below:

a How reliable in terms of security, privacy, and trust concerns for information sharing and new relationships development on SNSs?

b How do the members' information sharing relate to the development of new relationships?

c How effective does the relationships development among SNSs members towards the success of HEIs marketing?

2 Literature review

SM is an example of one of the many platforms included under the umbrella of Web 2.0. The term Web 2.0, is closely associated with Tim O'Reilly, involves online activities centred on the shift from the web as a place of producers and consumers of content to a place of communities. It allows the users to interconnect, communicate, collaborate and share, in contrast to websites where users are limited to the passive viewing of content that was created for them. Thereby, Jones (2009) defined SM as a category of online media where people are talking, participating, sharing, networking, and bookmarking online. Most SM services encourage discussion, feedback, voting, comments, and sharing of information from all interested parties. With the emergence of SM, the tools and the strategies for communicating with target people have significantly changed. B&C (2010) defined the SM application as an online technology tool to allow people to communicate easily, utilising the internet to share and discuss information. In line with Zarrella (2010), SM is defined best in the context of the previous media paradigm. Zarrella (2010) asserts that traditional media such as television, newspaper, radio and magazines are one-way, static broadcasting technologies. He argues that magazines and newspapers are distributing an expensive content to the readers while advertisers pay for the privilege in order to insert their ads. In addition, readers have no possibility to send their instant feedback if they disagree with something. Now it is easy for everyone to create, and most importantly, to distribute their own content with the new web technologies. A blog post, a 'tweet' on twitter, or a YouTube video can be produced and viewed by millions virtually for free. According to Zarrella (2010), SM comes in many forms: Blogs, micro blogs (Twitter), social networks (FaceBook), media-sharing sites (YouTube), social bookmarking and voting sites (Digg, Reddit), review sites (Yelp), forums, and virtual worlds (Second Life). SM is characterised by participation, openness, conversation, connectedness and sense of communality (Mayfield, 2008). Similarly, Palmer and

Koenig-Lewis (2009) defined SM as an "online applications, platforms, and media which aim to facilitate interactions, collaborations and the sharing of content". From these definitions, three core aspects can be identified to converge into SM: communication, collaboration, and sharing (Safran, 2010).

2.1 Communication

The most vital aspect of SM in the form of computer-mediated communication.

2.1.1 Discussion forums

Discussion forums are the earliest form of SM (Safran, 2010). It is an asynchronous, interactive form of communication system based on individual postings and replies, which form so-called threads. They can be implemented as stand-alone websites, or, more often, be integrated into other web-based applications or web-based educational systems (Helic et al., 2004).

2.1.2 Microblogging

Micro blogging is a form of blogging that limits the size of each post (Zarrella, 2010). It is a form of informal communication. Twitter is the best-known example of microblogging services. It gained popularity in the first half of 2009 due to its use by high-profile celebrity members. Twitter consists of posing individual, short messages, maximum of 140 characters, to the user's feed. These messages are called tweets. Either sending a direct message or replying to other users' tweets by adding @username to one's own tweets conducts communication with other users. The re-tweeting is one of the basic mechanisms to spread news in the microblogging context. Usually microbloggers subscribe to other users' feeds and become followers, in order to retrieve an aggregated feed of all their fields of interest. Zarrella (2010) describes Twitter as an easy tool which requires little time; but can quickly become valuable. It has been used for daily chatter, conversations, sharing information and reporting news (Java et al., 2007).

2.1.3 Social networking

Although SNSs is not new phenomenon, they are gaining increasing importance for many people's in the recent years, as they allow for interaction independently of a fixed location. Social networking sites are defined by Boyd and Ellison (2007), as web-based services aimed to visualise and maintain the social network of the users. It allows the individuals to

a create and maintain a public profile, usually including multi-layered options for privacy control of the individual types of personal information included

b articulate a list of connected users

c view and traverse along the lines of connections between the individual users.

Additionally, Weber (2009) defines social networking sites as "places where people with a common interest or concern come together to meet people with similar interest, express themselves, and vent". Gross and Acquisti (2005) state that social networking sites allow

people to exchange photos, videos, and other personal information. Such sites allow users to meet new friends and reconnect with old friends. Communication is conducted among the connected users of a network as well as within groups (Heidemann, 2010). Confirming to Koch et al. (2007), the structure of social networking sites can be mapped onto graphs consisting of nodes (users) and edges (relations). The backbone of SNSs consists of visible profiles that display an articulated list of friends who are also users of the system. Profiles are unique pages where one can 'type oneself into being' (Sundén, 2003). After joining an SNS, an individual is asked to fill out forms containing a series of questions. The profile is generated using the answers to these questions, which typically include descriptors such as age, address, telephone number, occupation, interests, an 'about me' section, and other details. Most sites also encourage users to upload a profile photo. Subsequently, users are prompted to identify others in the system with which they have a relationship. They are encouraged to make connections with other members of the site by marking others as 'Friends', 'Contacts', or 'Fans'. Most SNSs require bi-directional confirmation for friendship, but some do not (Boyd and Ellison, 2007). The two most popular SNSs for college students are FaceBook and MySpace. FaceBook was launched in 2004 as a service meant for students enrolled at Harvard University. Soon after, it opened its doors to students at other colleges, first to members of prestigious institutions then gradually a more diverse set of schools (Boyd and Ellison, 2007). In 2005, FaceBook provided limited access to teenagers from specific high schools and members of certain companies (Boyd and Hargittai, 2010). Finally, in 2006, the service became accessible to the public over 13 years old. FaceBook is made up of six primary components: personal profiles, status updates, networks (geographic regions, schools, and companies), groups, applications and fan pages (Reuben, 2009). MySpace is another familiar SNS for college students. It is launched in 2003 as an alternative to existing SNS, attracted an audience of users in their 20s and 30s. Soon after, it became popular with younger users. Google Plus is new SNS lunched in 2011. The main features of it are circles, hangouts, sparks, and huddle. Circles are contacts you can group, using different criteria for grouping, such as interests or types of contact; where contacts can be added to circles by drag and drop. With sparks user get the possibility for a keyword based research, offering a customised way of searching and sharing. Hangouts can be generated and used as an instant videoconferencing tool with circles, or selected contacts in circles. Huddle is part of the 'mobile' feature, offering services using a mobile phone, including other services as well, such as instant upload (for pictures and videos from a mobile phone to a private folder in Google Plus) and location (a service to add one's current location to every post).

2.2 Collaboration

The second of the essential components of the SM concepts is collaboration. According to Merriam-Webster (2009), it describes the act of working "jointly with others or together especially in an intellectual endeavour". Within the last ten years, the most archetypical online collaboration tool associated with the SM is wiki.

2.2.1 Wikis

The term wiki was originally introduced by Leuf and Cunningham (2001) "developer of the first wiki software, WikiWikiWeb," in 1995. They originally described it as "the

simplest online database that could possibly work" (Leuf and Cunningham, 2001). Wikipedia is the most popular wikis, operated by the Wikimedia foundation a non-profit charitable organisation. Since its creation in 2001, it has grown rapidly into one of the largest reference websites, attracting 470 million unique visitors monthly as of February 2012 (Wikipedia, 2012). Voss (2005) defined it as a user-created and user-maintained online encyclopedia. It had outnumbered offline encyclopedias, with more than 77,000 active contributors working on over 22,000,000 articles in 285 languages (Wikipedia, 2012). Wikipedia is based on collaborative authoring of the encyclopedic content by registered and unregistered users alike, and on free licencing of images and texts.

2.3 Sharing

The third of the essential components of the SM concepts is sharing.

2.3.1 Social bookmarking

Social bookmarking is a collaborative concept for internet users to organise, store, manage and search for bookmarks of resources online based on the notion of sharing bookmarks and thus enhancing the effectiveness for searching contents in the web. For the collaborating users social bookmarking tools provide powerful meanings to organise their own bookmarks, yet the core benefit lies in the integration of the references and added information from many users, as manually created reference collections provide trustful information sources due to the usually high quality (Yanbe et al., 2007). The users can describe and organise content with any vocabulary they choose on a social bookmarking site using the feature of tagging. Delicious is a tool to organise web pages, founded in 2003. In fact, it is popularised the terms 'social bookmarking' and 'tagging'. Delicious provides interesting bookmarks by integrating the manually created reference collections of their users (Safran, 2010).

2.3.2 Blogs

A weblog, a term coined by Barger in 1997, is a 'log of the web'. Pursuant to Weber (2009), blogs are online journals that can be personal or corporate, where people can post ideas, images and links to other websites. In addition, Zarrella (2010) defines a blog as a website that contains an online personal journal with reflections, comments and often hyperlinks provided by the writer. The use of weblogs, or blogs, increased dramatically between 2003 and 2004 (Rainie, 2005).

2.3.3 Podcasting

Podcasting is the audio equivalent of the weblogs. It is the creation and distribution of audio files via the internet (Safran, 2010). The subscription of a podcast is achieved by subscribing to an RSS feed.

2.3.4 Multimedia sharing

In order to share multimedia content, many social websites were created. YouTube is the leader in online video-sharing websites, lunched in February 2005. Users can upload,

view and share videos worldwide through the web. Picasa and Flicker are the most important image-sharing websites, on which the users can freely upload images and share it with friends and family, or public. Public photos may be viewed and commented on by others. SlideShare is focused on the publication of PowerPoint slides. Codepad can be used to share program code by software developers.

With the evolution, SM has become a part of everyday life and gained tremendous importance and publicity in the recent years for the majority of internet users. Higher education is facing big challenges nowadays, which have made a lot of HEIs interested in attracting more students and excellent staff. Likewise, the Malaysian ministry of higher education has taken up a lot of marketing strategies in order to make Malaysia a 'favoured' destination for international and local students. In fact, the rapid growth of SM has changed the way HEIs communicate. Today's students come to higher education as digital natives, with extensive experience in virtual environments and other new media (Bennett and Maton, 2010; Kemp and Haycock, 2008; Palfrey and Gasser, 2008; Tapscott, 2008; Almadhoun et al., 2011) and sometimes they are called 'millennial students'. Undoubtedly, it is important for student affairs professionals to be familiar with the technology that students use, especially since newer technologies can be used in ways that increase student engagement and ultimately improve educational outcomes (Astin, 1999; Hu and Kuh, 2001; Nelson Laird and Kuh, 2005). Similarly, college students expect faculty and student affairs staff to use newer technologies to connect to them (Junco and Mastrodicasa, 2007; Duderstadt et al., 2002). Hence, it is important for student affairs professionals to understand how students are using technology in order to engage their students more fully. In the light of the foregoing, the tools and the strategies for communicating with target students have significantly changed with the emergence of SM. Haythornthwaite and Kazmer (2002) supports the notion that SM can be utilised to develop student-to-student and student-to-instructor connections. Furthermore, incoming students have used social networking websites to help them connect with others with similar interests before they arrive on campus. Consequently, social network sites may function to improve the relationships between students which will affect the students' enrollment to the university. Research was conducted with first year undergraduates at a British university using an online survey. Students reported that they specifically joined 'FaceBook' pre-registration as a means of making new friends at university, as well as keeping in touch with friends and family at home (Madge et al., 2009).

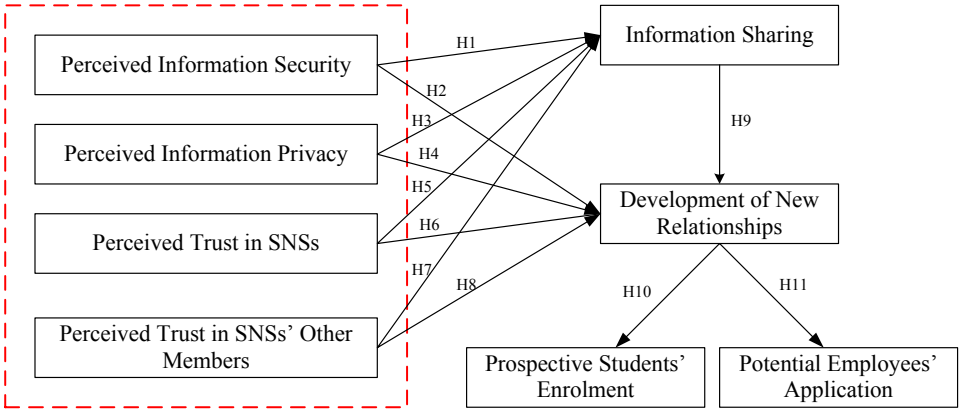
Although the SM sites offer attractive means of online social interactions and communications, it faces a number of challenges included privacy, security, and trust concerns. Brandtzæg et al. (2010) argue that the most important success factors on SNS: content sharing and sociability. They agree that the more that people feel their privacy is protected; the more they are willing to share and the reverse of this is also true. Trust is also important for successful online interactions and acts as an important role for many web-based companies (Ayyash et al., 2012; Thaw et al., 2012; Kim and Tadisina, 2010; Coppola et al., 2004). Trust is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer et al., 1995). For face to face, trust is a critical determinant of sharing information and developing new relationships (Fukuyama, 1995). Trust of SM affect what people are willing to share. For example, based on a survey study among 116 college students on the trust and privacy concern

within SNS FaceBook, users expressed greater trust in FaceBook than MySpace and thus were more willing to share identifying information in their profiles. However MySpace has stronger evidence of new relationship development, despite weaker trust results. In addition, if people do not trust each other, they will neither interact nor share. Subsequently, the research on trust in regard to privacy should therefore go beyond the study of 'site trust' (e.g., "I trust FaceBook") to involve 'social trust' (e.g., "I trust my friends") (Brandtzæg et al., 2010). Trust was one of the three major skills reported by individuals, in a sample of 52 individuals, who had a long-distance relationship. Reasons included that trust was essential for relationship development (Mietzner and Lin, 2005). According to Dwyer (2007), privacy within social networking sites is often not expected or is undefined. A survey study about privacy in SNSs in the Malaysian universities was found out that people seem to be more open in online social networks and are more willing to share information about them than in the real world even though they still did not use privacy enablers (Mohtasebi and Borazjani, 2010). Farther, in a sample of 205 students from a four-year undergraduate commuter inner city college, regarding users risk taking, trust, and privacy concerns in SNSs, those who had profiles had significantly greater trust and risk taking attitudes than those who did not have, indicating that they believed FaceBook is a more trustworthy social network. It also found that general privacy concerns and identity information disclosure concerns are of greater concern to women than men (Fogel and Nehmad, 2009). Another study was administered to 119 college undergraduates at a large university in the Midwestern USA found that FaceBook is deeply integrated in users' daily lives. Users claimed to understand privacy issues, yet reported uploading large amounts of personal information (Debatin et al., 2009). A qualitative study shows that most people use SNSs frequently to maintain contact with friends, as well as make new friends (Dwyer, 2007). Based on data mining and surveys of 294 US college and high school communities, Acquisti and Gross (2006), showed that FaceBook members are unconcerned about their privacy on FaceBook, and reveal a lot of information about themselves. Acquisti and Gross (2006) also found that 30% of respondents were completely unaware of the visibility of the their information and among the 16% of the participants who expressed the highest privacy concerns for a strangers, even so 22% provided at least their home address and 40% provided their schedule of classes(Acquisti and Gross, 2006).

3 Research design and method

The main objective of this study is to identify the factors that contribute to the students' willingness to share their information and establish new relationships using SNSs as secure, private, and trusted sites which will affect the prospective students' enrollments as well potential employees' application to the HEIs, and further study the relationship between those factors. The SNSs' members concerns on security, privacy, trust, and trust of other members' issues are considered to be the essential factors associating students' willingness to share information and new relationships' developments in SNSs. The model to be tested is shown in Figure 1.

Figure 1 Research model (see online version for colours)



Specifically, the following hypotheses are to be tested in this study:

H1 A member's perceived security of SNSs positively influences his/her willingness to share information.

H2 A member's perceived security of SNSs positively influences his/her willingness to develop new relationships.

H3 A member's perceived privacy of SNSs positively influences his/her willingness to share information.

H4 A member's perceived privacy of SNSs positively influences his/her willingness to develop new relationships.

H5 The trust of SNSs positively influences a member's willingness to share information.

H6 The trust of SNSs positively influences a member's willingness to develop new relationships.

H7 The trust of other members of SNSs positively influences a member's willingness to share information.

H8 The trust of other members of SNSs positively influences a member's willingness to develop new relationships.

H9 Sharing information of the member of SNSs positively influences a member's willingness to develop new relationships.

H10 Making new relationships in SNSs positively influence a student's willingness to enroll in higher education institution.

H11 Making new relationships in SNSs positively influence an employee's willingness to apply job in higher education institution.

In this study, a survey instrument in the form of questionnaire is used in order to collect the data using non-probability sampling method. The target group of respondents was 372 students from four public Malaysian universities, as well as three private universities.

Based on pilot study, the following possible items were considered in determining the possible factors associating SNSs users' willingness to share their information and establish new relationships: two items for perceived security, namely, feel safe providing info over SNSs (SPI) and adequate control to ensure security (ES). three items for perceived privacy, namely, info is kept more private than as it was two years ago (IMP), control over how info will be used (COI), and effective mechanism to address violation (EM). Three items for trust of SNSs, namely, SNSs will not use personal info for any other purpose (NPI), SNSs do not have ill intensions about members (NII) and SNSs are trustworthy (TW). Three items for trust of SNSs' other members, namely, worry about embarrassing by wrong information others post (WWI), trust linked friends to view all parts of online profiles (TLF), and trust strangers (TS). Six items for information sharing, namely, confidence for complex and advanced method (SAM), concern with the consequences of sharing identity info (SII), feel safe using real name on SNSs profile (RN), feel safe including email address on SNSs profile (EA), feel safe including phone number on SNSs profile (PN), and feel safe including self picture on SNSs profile (SP). Six items for development of new relationships, namely, confidence for complex and advanced method (RAM), and confidence for info sharing (IS), consider people in SNSs as friends (PF), feel safe to contact friends face to face after meeting them on SNSs (SFF), feel safe to contact friends via telephone after meeting them on SNS (ST), and feel safe to contact friends via e-mail after meeting them on SNSs (SE). Five items for prospective students' enrollment, namely, feel safe reaching out to a current university student to get their opinion about their university before applying to that school (SRS), confidence for new relationships development with admission offices employees (RDO), confidence for new relationships development with students (RDS), confidence for new relationships development with alumni (RDA), and universities SNSs pages have an impact on choosing decision (PID). Four items for potential employees' applications, namely, feel safe reaching out to a current university employee to get their opinion about their university before applying a job to that school (SRE), confidence for new relationships development with employees (RDE), believe that universities which use SNSs increase likelihood to apply for job (UAJ), and universities SNSs pages have an impact on job decision (PIJ).

372 respondents (65.3% females and 34.7% males) were participated for the purpose of analysis for this study. The majority of the respondents (about 60.0%) are aged between 21 and 25, and about 54.3% are Malay. 65.6% of the respondents who participated in the survey are undergraduate students with about 42.5% from science departments.

Out of the 372 respondents, almost all the respondents (about 95.7%) report that they create profiles in the SNS. The majority (96.1%) of them have profiles in FaceBook, while (21.8%) have profiles in Google Plus, (27.9%) have profiles on Twitter, (29.6%) have channels on YouTube, (34.5%) are using IM, (4.7%) have profiles in LinkedIn, and (14.9%) are using other SNSs. Out of the respondents who have SNSs profiles, majority (about 63.8%) are using SNSs for the purpose of searching information, followed by socialising with people they know offline (61.0%), educational purpose (53.9%), make new friends (51.7%), killing time (32.9%), peer pressure (25.1%), find jobs (10.5%), business oriented (9.9%), dating (8.0%), and other reasons (8.3%). In addition, (58.0%) are using SNSs from one to three years, while (23.8%) are using SNSs from four to six years, and (9.7%) are using SNSs more than six years. Moreover, (48.6 %) visit their

profiles from 1–2 times a day, while (30.4%) visit their profiles from 3–4 times a day, (14.6%) visit their profiles more than six times a day, and (6.4%) visit their profiles less than from 5–6 times a day.

3.1 Reliability analysis

A total of 32 items measuring four constructs and four dependent variables were assessed for reliability. Two items measuring information security concerns have a cronbach's alpha of 0.606, three items measuring information privacy concerns have a cronbach's alpha of 0.656, three items measuring trust of SNSs have a cronbach's alpha of 0.900, three items measuring trust of SNSs other members have a cronbach's alpha of 0.606, six items measuring information sharing have a cronbach's alpha of 0.621, six items measuring development of new relationships have a cronbach's alpha of 0.744, five items measuring prospective students' enrollment have a cronbach's alpha of 0.788, and four items measuring potential employees' applications have a cronbach's alpha of 0.835.

3.2 Factor analysis

Using principal component analysis, all the 32 items on members' perceived security, perceived privacy, trust of SNSs, trust of SNSs other members, information sharing, development of new relationships, prospective students' enrollment, and potential employees' applications were analysed. Initial factor extraction revealed eight components with an absolute magnitude of eigenvalue greater than 1.0. All the eight principal components together accounted for 61.420% of the total variance in the original 32 items. Table 2 shows the results of factor analysis. It was observed that most items loaded onto the extracted factors. However, some items that were conceptualised to measure information privacy concerns and development of new relationships had factor loading lower than 0.50.

Table 2 Factor extraction and factor loading

Items	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*	*Factor 6*	*Factor 7*	*Factor 8*
SPI	0.508							
ES		0.686						
IMP		0.655						
COI		0.662						
NPI			0.837					
NII			0.797					
TW			0.764					
WWI				0.704				
TLF				0.781				
TS				0.618				

Table 2 Factor extraction and factor loading (continued)

Items	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*	*Factor 6*	*Factor 7*	*Factor 8*
SAM					0.700			
SII					0.854			
RN					0.598			
EA					0.793			
PN					0.693			
SP					0.675			
IS						0.538		
SFF						0.801		
ST						0.822		
SE						0.713		
RAO							0.602	
RDS							0.678	
RDA							0.592	
SRS								0.501
PID								0.748
SRE								0.794
RDE								0.670
UAJ								0.791
PIJ								0.754

4 Results and discussion

Correlation analysis was performed to measure the relationship among dependent and independent variables. Pearson correlation coefficients were performed in order to determine the relationships between perceived security, perceived privacy, trust of SNSs, and trust of SNSs other members with information sharing, and development of new relationships. Moreover, they were performed to determine the relationships between development of new relationships with prospective students' enrollment, and potential employees' applications. The results showed that there was a very low association (r = 0.044) existed between perceived security and members' willingness to share information. In addition, A low correlation (r = 0.065, p > 0.05) existed between perceived privacy and members' willingness to share information, which implied that perceived security and perceived privacy had no impact on members' willingness to share information. This can be said that SNSs' users reveal a lot of information about them, and are not very aware of privacy and security options or who can actually view their profile. However, the construct of trust on SNSs slightly manifested itself primarily through information sharing (r = 0.168, p = 0.001). A low correlation (r = 0.074, p > 0.05) existed between trust SNSs' other members and members' willingness to share information. Additionally, the results showed that there was a fair correlation (r = 0.140 with p = 0.007) existed between perceived privacy and development of new relationships, which implied that the members' willingness to develop new relationships was increased

with the increase of privacy concerns in SNSs. In addition, the construct of SNSs trust ($r = 0.234$, $p = 0.000$), and trust of SNSs' other members ($r = 0.172$, $p = 0.001$) slightly manifested itself primarily through development of new relationships.

A slight positive correlation ($r = 0.116$, $p < 0.05$) existed between information sharing and development of new relationships. The members' perceived privacy of SNSs had no impact on their willingness to develop new relationships ($r = 0.065$, $p > 0.05$), as shown in Table 3.

Table 3 Factors correlation

	Security	*Privacy*	*Trust*	*Trust-Oth.*	*Sharing*	*Relationships*
Security	1.000					
Privacy	0.325	1.000				
Trust	0.349	0.333	1.000			
Trust-Oth.	0.133	0.080	0.143	1.000		
Sharing	0.044	0.065	0.168	0.074	1.000	
Relationships	0.140	0.082	0.234	0.172	0.116	1.000

The results also showed that there was a strong positive correlation ($r = 0.244$, $p = 0.000$) existed between development of new relationships and prospective students' enrollment. Similarly, there was a strong positive correlation ($r = 0.215$, $p = 0.000$) existed between development of new relationships and potential employees' application, which implied that the increase in making new relationships have an impact on students and employees decisions, as shown in Table 4.

Table 4 Development of new relationships/students enrollment – employees applications

	Relationships	*Enrollment*	*Application*
Relationships	1.000		
Enrollment	0.244	1.000	
Application	0.215	0.647	1.000

Regression analysis was performed to study the relationship between the predictors of members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members with information sharing, and development of new relationships. Moreover, it was performed to determine the relationships between development of new relationships with prospective students' enrollment, and potential employees' applications.

A multiple regression analysis was performed to evaluate the relationship between the predictors of members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members with information sharing. Table 5(a) through Table 5(c) presented the results of multiple regression analysis computed for information sharing as a dependent variable and the four predictors which were security and privacy concerns, trust of SNSs, and trust of SNSs' other members.

The linear combination of the members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members was significantly related to the members' willingness to share information $F(4,366) = 2.976$, $p < 0.05$ as shown in Table 5(b). The results showed that members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members will influence members' willingness to share information or how soon they will share their information in near future. The sample multiple

correlation coefficients was 0.177, indicating that about 3.2% of the variance for the members' willingness to share information in the sample could be accounted for by the linear combination of members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members.

The results showed that only one predictor (members' trust on SNSs) was found to be significant to the members' willingness to share information, $p < 0.05$. In overall, the regression model showed 2.1% (adjusted R square = 0.021) of the members' willingness to share information would be influenced by members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members.

Table 5(a) Regression model summary

Model	*R*	*R square*	*Adjusted R square*	*Std. error of the estimate*
1	0.177	0.032	0.021	0.63777

Notes: Predictors: (constant), security, privacy, trust, trust others
Dependent variable: information sharing

Table 5(b) ANOVA

Model		*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
1	Regression	4.842	4	1.211	2.976	0.019(a)
	Residual	148.873	366	0.407		
	Total	153.715	370			

Notes: Predictors: (constant), security, privacy, trust, trust others
Dependent variable: information sharing

Table 5(c) Predictors coefficients

	Unstandardised coefficients		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	2.453	0.223		11.020	0.000
Security	–0.020	0.042	–0.027	–0.471	0.638
Privacy	0.012	0.047	0.015	0.262	0.793
TrustT	0.139	0.048	0.165	2.902	0.004
Trust-OTH	.0056	0.055	0.053	1.009	0.314

Notes: Dependent variable: information sharing

The results also showed that members' perceived security had a fair positive relationship with the development of new relationships. The sample correlation coefficients was 0.14, indicating that only 2.0% of the variance for the members' willingness to develop new relationships in the sample could be accounted for members' perceived security measures. Moreover, the regression model showed only 1.7% (adjusted R square = 0.017) of the members' willingness to develop of new relationships on SNSs would be influenced by members' perceived privacy. Members' perceived privacy on SNSs did not have impact on their willingness to develop new relationships, $t = 1.529$, $p > 0.05$.

The strong positive relationship between members' trust on SNSs with its members and their willingness to develop new relationships meant that members would like to develop more new relationships with other members on SNSs if they trust the sites and

their other members. For the trust of SNSs, the sample correlation coefficients was 0.234, indicating that 5.5% of the variance for the members' willingness to develop new relationships in the sample could be accounted for members' trust on SNSs. Moreover, the regression model showed only 5.2% (adjusted R square = 0.052) of the members' willingness to develop of new relationships on SNSs would be influenced by members' trust on SNSs.

For the trust of SNSs' other members, the sample correlation coefficients was 0.172, indicating that 3.0% of the variance for the members' willingness to develop new relationships in the sample could be accounted for members' trust on SNSs' other members. Moreover, the regression model showed only 2.7% (adjusted R square = 0.027) of the members' willingness to develop of new relationships on SNSs would be influenced by members' trust on SNSs' other members.

The regression analysis of the study showed that three predictors (perceived security, trust of SNSs, and trust of SNSs' other members) out of four predictors was found to be slightly significant ($p < 0.05$) members' willingness to develop of new relationships on SNSs. In overall, the regression model showed only 6.7% (adjusted R square = 0.067) of the members' willingness to develop new relationships on SNSs would be influenced by members' perceived security, perceived privacy, trust of SNSs, and trust of SNSs' other members, as shown in Table 6.

Table 6 Regression analysis results for development of new relationships

Construct	*Standard coefficients Beta*	*t-value*	*Sig.*
Perceived security	0.140	2.724	0.007
Perceived privacy	0.082	1.592	0.112
Trust of SNSs	0.234	4.639	0.000
Trust of SNSs' other members	0.172	3.366	0.001
Information Sharing	0.116	2.248	0.025

Two simple regression analyses were performed to evaluate the relationship between the development of new relationships on SNSs and the HEIs' marketing which included the prospective students' enrollment, and potential employees' applications.

The results showed that members' willingness to develop new relationships on SNSs had a positive relationship with the prospective students' enrollment. It meant that students would like to enroll in HEI more if they make new relationships with other students from the same HEI. The sample correlation coefficients was 0.244, indicating that 6.0% of the variance for the prospective students' enrolment in the sample could be accounted for the development of new relationships measures. Moreover, the regression model showed only 5.6% (adjusted R square = 0.056) of the prospective students' enrollment would be influenced by the members' willingness to develop new relationships on SNSs, as shown in Table 7.

Table 7 Regression analysis results for prospective students' enrollment

	Unstandardised coefficients		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	2.774	0.172		16.133	0.000
New relationships	0.230	0.059	0.244	3.929	0.000

The results also showed that members' willingness to develop new relationships on SNSs had a positive relationship with the potential employees' applications. It meant that students would like to enroll in one university if they make new relationships with other students from the same university. The sample correlation coefficients was 0.215, indicating that 4.6% of the variance for the potential employees' applications in the sample could be accounted for the development of new relationships measures. Moreover, the regression model showed only 4.4% (adjusted R square = 0.044) of the potential employees' applications would be influenced by the members' willingness to develop new relationships on SNSs, as shown in Table 8.

Table 8 Regression analysis results for potential employees' applications

	Unstandardised coefficients		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	2.800	.164		17.064	.000
New relationships	.233	.055	.215	4.233	.000

5 Limitations and recommendation for further study

The study has some limitations; the study did not take into consideration gender biases, cultural biases, and other demographic variables with the research hypotheses. Moreover, the model may have excluded other possible factors influencing the development of new relationships in SNSs (i.e., the study did not consider other beliefs, such as perceived ease of use). Further, the assumptions of this study were that participants would read carefully and comprehend all questions presented within the online survey questionnaire, and would answer all questions completely and honestly.

In addition, the findings may not represent Malaysian HEIs as a whole; therefore, any generalisation of the findings may not be 100% reliable. Future studies can link other demographic variables as well as include other factors and study the interrelationships between factors (i.e., relationships between security, privacy, and trust). Further, future studies can differentiate between the perceptions of HEIs who are using SNSs with the perceptions of HEIs who do not have pages in SNSs, also differentiate between the perceptions of students who do not have profiles in SNSs with the perceptions of students who have profiles in SNSs.

6 Conclusions

In general, the results presented increase our knowledge about the emergence of SNSs and its usage by the students in the Malaysian HEIs. Findings from this study indicated that perceived security and privacy are still to be slight concerns for members' willingness to share their information; though there is a strong association existed between perceived security, trust of the SNSs and its members with the members' willingness to develop new relationships with others. Despite the fact that SNSs today employ the privacy information practices, members do not have the ability to fully understand up to a sufficient degree to allow accurate modelling of behaviour and

activity. Moreover, they would like to make new friends and develop new relationships online more if they share more information about themselves in order to contact with others with similar interests. Finally, the current study has determined that the relationships development inside the SNSs significantly affect the students' enrollment and employees' applications to the HEIs. They believed that the HEIs pages on SNSs have an impact on their decision about the HEI they choose to attend. Thus, Malaysian HEIs should improve their connection to the SNSs in creative ways that will be beneficial for their students and their institutions; also it will be important for them to understand the reasons of using SNSs by students in addition to how students are using this technology, so they can take advantages from the SNSs as a promotional tool.

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