EUROPEAN ACADEMIC RESEARCH
Vol. III, Issue 10/ January 2016

Impact Factor: 3.4546 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Security Awareness of System Users

SENKATHIR. R[1]
Doctoral Research Scholar
Department of International Business
School of Management
Pondicherry Central University, India
Dr. BUSHAN D. SUDHAKAR
Associate Professor
Department of International Business
School of Management
Pondicherry Central University, India

Abstract:

Technology aids in facilitating people for easier Communication. It plays a major role to serve social needs in several aspects. Internet becomes one of many technologies most people use in daily life for several purposes, such as Electronic Commerce, Online Internet banking, and other online operations. With all these facilities available to many people, there is also the other side of it which can also be harm to people as well. Therefore, this research work attempts to examine some of the threats people might have experienced by focusing on analysing the Information Security awareness of respondents. The sample size is 134 Internet Users whose age range between 20 and 60 years old. A dynamic model with selected constructs has been proposed and has been tested for fitness. A survey was conducted using paper based and mail based instrument. The work aims to find out the impact of factors, such as Gender, Age, Income level, Education level, Internet usage on the Information security awareness of the respondents.

[1] Corresponding author: ram.senkathir@gmail.com

Key words: Cyber Espionage, Identity Theft, Information Security Awareness (ISA)

1. INTRODUCTION

Identity Theft is a criminal act of using e- mails, websites, or even telephone as a media. The Identity Thieves pretend themselves to look like they come from well-known, legitimate, and trusted businesses, financial institutions, and/or government agencies in an attempt to gain personal and sensitive information [Irani, D., et. al.]. When Identity Thieves obtain victims' sensitive information, such as credit card numbers, they will commit online activities using obtained information for their own benefits.

The challenge of defending against Identity Thieves is underscored by the fact that most of the domains being used for attacks were legitimate sites that had been compromised by bad guys, with only 28 percent of them being registered maliciously by the Identity Thieves. Overall, 60 percent of attacks identified by APWG occurred in four top-level domains: .com, .cc, .net and .org; and 89 percent of the malicious domains were registered in .com, .tk, .net and .info.

The purpose of this paper is to compare the various factors like Gender, Age, Internet Usage, and Educational Qualification influencing the Information Security awareness.

2. LITERATURE REVIEW

A. Information Security Awareness

Information security awareness can be defined as the knowledge and attitude members of an organization possess regarding the protection of the physical and especially, information assets of that organization (Heru and Mohammad, 2012). The goal of information security is to ensure business continuity and to minimize business damage by preventing and

minimizing the impact of security incident (Posthumus and Solms, 2004). Information security awareness is the common issue in any information system (IS) security management. Organization must be made to realize the importance of building up information security awareness, in order to ensure that information security accidents can be avoided. Any effort that is related to information security awareness usually involves the change of behavior of the end-users or the reinforcement of good security practices amongst the users.

B. Factors Influence Information Security Awareness

Gender; Age; Income Level; Internet usage (Heavy and Light Users); Educational Qualification

C. Information Security Threats

Computer crime mainly consists of unauthorized access to computer systems, data alteration, data destruction, or theft of intellectual property. Computer crime is very similar to a normal crime. The only difference is the means in which the act is carried out. An individual can commit theft, trespassing, embezzlement, and fraud using a computer system. The characteristic of computer crime composed of: invisibility/anonymity of offender, a lack of awareness, unwillingness to report, and intangibility of digital goods, evidence, and value.

It is often assumed that Information Security Threats is about finance-related institutions, e.g., banks, credit unions, Paypal, auction sites, etc. However, in practice, target data is not necessary related to the victim's personal finances. This type of attack can be intended to access quite different forms of data. Non- commercial entities may also need to allow clients to volunteer financial information to pay for services electronically. As a result, potential victims are conditioned to share sensitive data with groups masquerading as taxation departments, healthcare and social security agencies, law enforcement agencies, etc.

Identity Theft can acquire target's information easier, it uses database to store the target's information. According to the study on psychology, human being has nature to be helpful when people are in real need. They show the tendency to trust people and fear of getting into trouble. Therefore, people need to be trained in order to defend against all fraud. Since this study aims at analysing the Information Security awareness of respondents, the hypotheses are:

$H_0$1: Men are not more Information Security aware than Women

$H_0$2: Age has no influence on Information Security awareness

$H_0$3: Level of Income has no influence on Information Security awareness

$H_0$4: Heavy Internet Users are not much Information Security aware than Light Internet Users

$H_0$5: Educational Qualification has no influence on Information Security awareness

According to [Jagatic, T.N, and et.al.], the gender does not provide a significant effect on the success rate of phishing. Moreover, reference [Colley, A. et. al.] states that the Information Security awareness strongly affects more on women than men. That is, identity thieves could gain benefit from women easily than men.

3. METHODOLOGY

A. Data

In order to capture reliable estimates from a large group of fairly homogenous targets for the Identity Thieves, our data collection effort focused on Academicians including Professors, Researchers, Software professionals, Post Graduate students, Business Entrepreneurs, Employees of Knowledge Process Outsourcing, Automobile component manufacturing unit.

B. Data Collection

Overall, the data collection effort resulted in 134 responses whose age is in the range between 20 to 60 years old. The data was collected by utilizing several tools such as e-mail, and hard copy paper based survey.

4. DEMOGRAPHIC RISK FACTORS FOR INTERNET ADDICTION

Studies indicate that the use of computers and the Internet differs between men and women. Weiser (2000) gave an extensive review and executed a study on gender differences in Internet use patterns and Internet application preferences in a sample of 1190 surveys. He concluded that there were numerous gender differences in preferences for specific Internet applications. Results had shown that men use the Internet mainly for purposes related to entertainment and leisure, whereas women use it primarily for interpersonal communication and educational assistance. However, additional analyses showed that several gender differences were mediated by differences in age and Internet experience.

Chen and Peng (2008) conducted an online survey on 49,609 students from 156 universities in Taiwan. They defined heavy Internet users as those who used the Internet over 33.9 hours per week and those under this threshold as non-heavy users. Differences in academic grades and learning satisfaction between heavy and non-heavy Internet users were statistically significant. Non-heavy users had better grades and greater learning satisfaction than heavy users. Although the authors did not study IA per se, the data suggested that students who spend a significant amount of time online, experience academic and learning difficulties. Internet addicted users spend excessive amounts of time in front of their computers.

5. STATISTICAL ANALYSIS

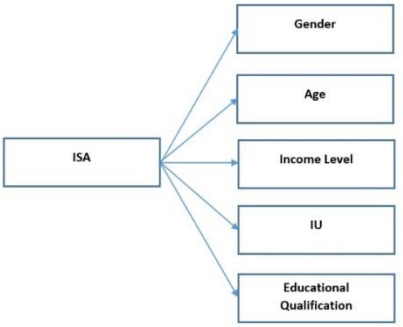
Univariate analysis was performed to examine the factors of the questionnaire associated with Information Security Awareness (ISA). Levels of significance were reported. Next, Independent sample T-Test, ANOVA tests were performed. In all calculations, p values above 0.05 were considered significant.

Predicting Factors of Internet Addiction

Multiple logistic regression was performed with Internet addiction as the dependent variable to assess the impact of a number of factors on the likelihood of developing Information Security Awareness.

The model contained independent categorical variables: Gender, Age, Internet daily use, Income level, Educational Qualification. The full model containing all predictors was statistically significant, indicating that the model was able to distinguish between Information Security Aware and Not aware respondents.

6. PROPOSED MODEL FOR FACTORS INFLUENCING INFORMATION SECURITY AWARENESS



The proposed model for the information security awareness consist of the following constructs: Gender; Age; Internet usage; Educational Qualification. The hypotheses are:

$H_0$1: Men are not more Information Security aware than Women

$H_0$2: Age has no influence on Information Security awareness

$H_0$3: Level of Income has no influence on Information Security awareness

$H_0$4: Heavy Internet Users are not much Information Security aware than Light Internet Users

$H_0$5: Educational Qualification has no influence on Information Security awareness

7. RESEARCH METHODOLOGY

The quantitative method using a survey questionnaire was performed for this study.

A. Research Design

The research was conducted with the Internet Users. A survey questionnaire was used as the instrument.

B. Population and Sampling

The estimated population for this study is 134. Due to the small number in population size, the survey questionnaire was distributed to all respondents in the population.

C. Measures

The survey questionnaire instrument mainly focuses on the demographic questions about the respondent's gender, age, education background, working position, working experience and information security awareness training attended. The questionnaire is using the 5-point Likert scale to measure the ISA with the following responses: Not at all aware = 1, Slightly Aware = 2, Somewhat Aware = 3, Moderately Aware = 4, Extremely Aware = 5

D. Data Analysis

Descriptive analysis, reliability analysis and correlation coefficient analysis were done using SPSS version 20 for Windows.

8. RESULTS AND FINDINGS

Descriptive analysis has been chosen to analyze demographic profile respondents and Pearson's correlation has been used to examine the relationship between constructs.

A. Descriptive Profile of Respondents

The questionnaire was distributed to 134 respondents from different sects of people such as Academicians including Professors, Researchers, Software professionals, Post Graduate students, Business Entrepreneurs, Employees of Knowledge Process Outsourcing, Automobile component manufacturing unit. 134 respondents participated in this survey. Table 1 shows the descriptive profile of respondents.

Table (1): Descriptive profile of respondents

Profile of Respondents		Frequency	%
Gender	Male	108	81
	Female	26	19
Age	20 to 30	94	70
	31 to 40	36	28
	41 to 50	2	1
	Above 50	2	1
Computer Working Experience	Less than a year	9	7
	1 – 10 Years	65	49
	More Than 10 Years	60	44
Attended Information Security Training	Yes	74	55
	No	60	45
Total		134	

The table showed that majority of respondents were male (81%). The age distribution of respondents showed that majority of respondents belongs into the age group of 20 to 30 years old (94%). Majority of the respondents (60%) have never attended any information security training.

B. Hypotheses Testing

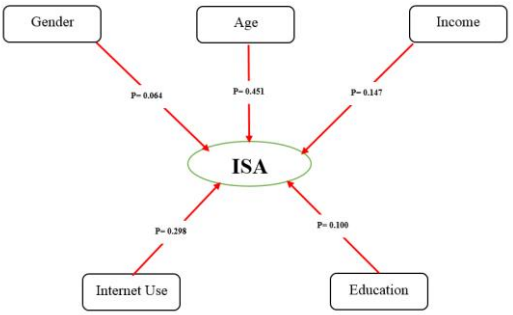


Table 2 shows that the summary of the hypothesis testing. The results indicated that the hypotheses $H_0$1, $H_0$2, $H_0$3, $H_0$4 and $H_0$5 are supported. The Independent Sample T-Test was performed to compare the mean scores of Male and Female respondents. Levene`s Test for Equality of variances (Homogenisity) result shows that significant value is 0.064 which is greater than 0.05,which means both Male and Female are homogeneous group. The Hypothesis, $H_0$1 is Accepted which means that there is No difference in ISA between men and women.

One way Anova was used to compare ISA among various Age Groups. Based on the result generated by SPSS, the significant value is 0.451 and it is greater than 0.05, so Null hypothesis, $H_0$2, is accepted. Age has no influence on Information Security awareness.

One way Anova was used to compare ISA among various Income Level Groups. Based on the result generated by SPSS, the significant value is 0.147 and it is greater than 0.05, so Null hypothesis, $H_0$3, is accepted. Income Level has no influence on Information Security awareness.

For $H_0$4 Levene`s Test for Equality of variances (Homogenisity) result shows that significant value is 0.298 which is greater than 0.05, so Null hypothesis, $H_0$4, is accepted, which means that there is No relationship between Internet usage and ISA.

One way Anova was used to compare ISA among various Educational Qualification Groups. Based on the result generated by SPSS, the significant value is 0.100 and it is greater than 0.05, so Null hypothesis, $H_0$5, is accepted, which means that Educational Qualification has no influence on Information Security awareness.

Table (2): Hypotheses Testing Results

Hypotheses	Results	Implications
$H_0$1	Accepted	No difference in ISA among Gender
$H_0$2	Accepted	Age has no influence on ISA
$H_0$3	Accepted	Income Level has no influence on ISA
$H_0$4	Accepted	No relationship between Internet usage and ISA
$H_0$5	Accepted	Educational Qualification has no influence on ISA

9. CONCLUSION

The aim of this study was to evaluate the information security awareness of respondents. The findings revealed that Gender; Age; Internet usage; Educational Qualification of the respondents is significantly related with the information security awareness. These results suggest that respondents are aware of their responsibilities. Feedbacks from users indicate that they have necessary knowledge in handling information security issues, such as phishing email. There seems to be no difference in ISA between men and women. Both the genders are equally aware. Age factor has no influence on ISA, varied age group people from 20 to 60 years old were considered. Varied Income level people ranging from Rs.25, 000 to 1, 00,000 per month were considered and it was found that the Income Level has no influence on ISA. Respondents who use Internet for more than 5 hours or less, per day were considered, no relationship exists between Internet usage and ISA. Respondents with varied Educational backgrounds were considered ranging from Diploma Holders to Ph.D. It was found that Educational Qualification has no influence on ISA.

The associated financial institutions such as Banks should play a role in educating and improving their customers' understanding on the importance of keeping the Financial Credentials like Internet Login User name and Password safe.

REFERENCES

Phishing activity trends report. Anti-Phishing Working Group, 2012.

Chen, Ying-Fang, and Samuel S. Peng. "University students' Internet use and its relationships with academic performance, interpersonal relationships, psychosocial adjustment, and self-evaluation." *CyberPsychology & Behavior* 11, no. 4 (2008): 467-469.

Colley, Ann, and John Maltby. "Impact of the Internet on our lives: Male and female personal perspectives." *Computers in human behavior* 24, no. 5 (2008): 2005-2013.

Frangos, Christos, Constantinos Frangos, and Apostolos Kiohos. "Internet Addiction among Greek University Students: Demographic Associations with the Phenomenon, using the Greek version of Young's Internet Addiction." *International Journal of Economic Sciences and Applied Research* 1 (2010): 49-74.

Irani, Danesh, Steve Webb, Jonathon Giffin, and Calton Pu. "Evolutionary study of phishing." In *eCrime Researchers Summit, 2008*, pp. 1-10. IEEE, 2008.

Jagatic, Tom N., Nathaniel A. Johnson, Markus Jakobsson, and Filippo Menczer. "Social phishing." *Communications of the ACM* 50, no. 10 (2007): 94-100.

Posthumus, Shaun, and Rossouw Von Solms. "A framework for the governance of information security." *Computers & Security* 23, no. 8 (2004): 638-646.

Susanto, Heru, and Mohammad Nabil Almunawar. "Information Security Awareness: A Marketing Tools for

Corporate's Business Processes." *Computer Science Journal, August* (2012).

Weiser, Eric B. "Gender differences in Internet use patterns and Internet application preferences: A two-sample comparison." *CyberPsychology and Behavior* 3, no. 2 (2000): 167-178.

APPENDIX

$H_0$1: Men are not more Information Security Aware than Women

Null hypothesis accepted

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ISA	Equal variances assumed	.668	.415	-1.869	132	.064	-.34345	.18374	-.70690	.02000
	Equal variances not assumed			-1.734	35.019	.092	-.34345	.19811	-.74563	.05873

$H_0$2: Age has no influence on Information Security Awareness

Null hypothesis accepted

ANOVA

ISA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.919	3	.640	.885	.451
Within Groups	93.935	130	.723		
Total	95.853	133			

$H_0$3: Level of Income has no influence on Information Security Awareness

Null hypothesis accepted

ANOVA

ISA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.883	4	1.221	1.731	.147
Within Groups	90.970	129	.705		
Total	95.853	133			

$H_0$4: Heavy Internet Users are not much Information Security Aware than Light Internet Users

Null hypothesis accepted

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ISA	Equal variances assumed	.711	.401	1.045	105	.298	.16940	.16210	-.15201	.49082
	Equal variances not assumed			1.068	87.694	.289	.16940	.15868	-.14595	.48475

$H_0$5: Educational Qualification has no influence on Information Security Awareness

Null hypothesis accepted

ANOVA

ISA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.480	3	1.493	2.124	.100
Within Groups	91.374	130	.703		
Total	95.853	133			