

## "An Empirical Analysis of Spyware Issue in E-marketing"

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### Abstract

Marketers must accept responsibility for the consequences of their activities and make every effort to ensure that their decisions, recommendations and actions function to identify, serve and satisfy all relevant publics : customers, organizations and society. Spam, viruses and spyware continue to grow exponentially, despite the first federal law regulating junk e-mail and other laws combating spyware and adware. All these nuisances are associated and we must be always careful because they can come from e-mail, from downloading software, and by simply clicking a link in an unsafe website. Spyware can lead to financial loss, as in identity theft and credit card fraud, and it can also reduce consumers' confidence in online safety and their willingness to participate in modern electronic commerce. In the study the terms E-Marketing, internet marketing and online marketing is used interchangeably. Factor analysis has been used in the present study and reliability and validity of the results have been checked. This paper gives an overview of spyware and consumers perception toward it along with outlines to defend against it.

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### INTRODUCTION

E-Marketing or electronic marketing refers to the application of marketing principles and techniques via electronic media and more specifically the Internet. The terms E-Marketing, internet marketing and online marketing, are frequently interchanged, and can often be considered synonymous. E-Marketing is the process of marketing a brand using the Internet. It includes both direct response marketing and indirect marketing elements and uses a range of technologies to help

connect businesses to their customers. The basics of marketing remain the same creating a strategy to deliver the right messages to the right people. What has changed is the number of options you have.

While E-marketing has grown rapidly in previous years, some of the unethical practices related to certain aspects of online marketing, such as spyware, has raised concerns on the part of Internet users. "E-Marketing or electronic marketing refers to the application of marketing principles and techniques via electronic media and more specifically the Internet" (Faisal Al-Madi *et al.*, 2005). The rapid growth and evolution of the E-marketing has created a number of unethical practices along with ethical issues. Spyware can be defined as any software that gathers internet user's information through the user's internet connection without their consent and knowledge. Spyware is similar to a Trojan horse in which internet users unwillingly install the unknown software when they install something else and installed unknown software collects the user's information unethically. Spyware steals information by using the computer's memory resources.

According to [www.whatis.com](http://www.whatis.com); spyware is any technology that aids in gathering personal information about a person or organization without their knowledge online. On the internet, spyware is programming that is put in someone's computer secretly to gather information about the user and relay it to advertisers or other interested parties. Spyware can get in a computer as a software virus or as the result of installing a new program.

According to Rowland and McDonald (2000), "Spyware can be defined as an agent technology or software, which is bundled into another piece of software".

The Federal Trade Commission (FTC 2005) provides the comprehensive definition of "Spyware is software that aids in gathering information about a person or organization without their knowledge and that may send such information to another entity without the consumer's consent or that asserts control over a computer without the consumer's knowledge".

Spyware has emerged as one of the most serious scourges of the online market. Millions of people likely have spyware software on their computers, and no one acknowledge they have it. Or, they may have agreed to its installation by clicking their assent to a license agreement that came with software that they downloaded.

Usually unknowingly installed spyware can control or manage user activities and can even gather important private or personal information like email passwords and Credit Card number. Spyware can significantly reduce a computer's



performance and led to computer system crashes. Because spyware exists as independent programs, have the ability to monitor keystrokes, scan files of computer and snoop other applications, like chat programs or word processors, install other spyware programs, read cookies, change the default home page on the web browser, consistently relaying this information back to the spyware owner who can either use it for advertising/marketing purposes or sell the same to another party.

It has been estimated that excluding cookies, almost 70 percent of user's computer contain some form of spyware (FTC Report, June 2005). The serious damage that spyware can cause includes the following :-

- Spyware can lead to identity theft when a Key stroke logger, Capturer all Key Strokes the user types on the Keyboard, including passwords and PIN Numbers.
- It can monitor, manage and collect sensitive information.
- It can impair computer operation and performance.
- It can assent control over the operation of computes in ways that substantially limit the ability of consumers to use their computers. In some cases, it may take the computer to adult content websites.

The right to privacy is a fundamental right as per our constitution. As shown above, spyware is capable of sophisticated surveillance and has not been introduced into the computer in an open manner. The computer user is not aware of the surveillance and therefore, continues to behave in an open uninhibited manner. Despite legal measures, the legal position of spyware is not clear and there are legal grounds for claiming that the software is legal. Brown (2007) found several states have passed anti spyware legislation. State attorneys have launched many legal proceedings against deceptive spyware firms based on the new antispware legislation as well as other state and federal consumer laws such as the Computer Fraud and Abuse Act and the Electronic Communications Privacy Act.

#### **BACKGROUND OF THE STUDY**

Just as the E-Marketing created many exciting new opportunities, it also introduced many new questions that warrant careful study. Many researches/ studies have been conducted regarding Spyware issue in E-marketing and their implications thereof. Some of such studies variables wise have been discussed :

Spyware allow hackers and marketers to monitor consumer's visits online. Some hackers use spyware programs to control and monitor the user's online activities (CIS, 2012).

## Summary of Studies along with Factors and Variables

Factors	Variables	Studies
Control	Monitor consumer's visits	CIS (2012)
	Misuse of personal information	Liu <i>et al.</i> (2005), Hui <i>et al.</i> (2007), Jensen <i>et al.</i> (2005), Pan and Zinkhan (2006), Gefen <i>et al.</i> (2003), Cheung and Lee (2006)
	Collects personal data	Paine <i>et al.</i> (2007), Micu <i>et al.</i> (2010)
	Violate privacy	Wang, Lee, and Wang (1998), Wills and Zeljkovic (2011), Sariou <i>et al.</i> (2004)
Unawareness	Downloading free software	Human Capital (2009), CIS(2012), Arnold and Reynolds (2009), Crowe and Higgins (1997)
	Installed automatically	Sandra (2008), FTC (2008)
	Unknown software	AOL (2004), Moshchuk <i>et al.</i> (2006)
	Prior consent	CIS (2012), Zhang (2005)
	Major problem	Jaeger and Clarke (2006)
Unsecure	Consumer's awareness	CIS (2012), Freeman and Urbaczewski (2005), Zhang (2005), Qing and Tamara (2005), Software Inc (2005)
	Contract law	Hui <i>et al.</i> (2007), Jensen <i>et al.</i> (2005), Pan and Zinkhan (2006), Gefen <i>et al.</i> (2003), Cheung and Lee (2006)
	Visit unknown websites	Micu <i>et al.</i> (2010)

Unethically collected information may be misused by the E-marketers. E-marketers can do a lot for reducing the consumers' fears related to privacy. It is up to companies how they maintain and use personal information of consumers increases consumer's trust (Liu *et al.*, 2005). The presence of a marketer's online privacy policy decreases consumer's privacy concerns (Hui *et al.*, 2007; Jensen *et al.*, 2005; Pan and Zinkhan, 2006). Consumers trust e-marketers if they have privacy policy (e.g., Gefen *et al.*, 2003) and are not afraid of privacy problems with them, such as e-marketers selling personal information to third parties with or without permission (Cheung and Lee, 2006).

Spyware is used by marketers to collect personal data of consumers.



Paine *et al.* (2007) opined the consumer's main concerns about online privacy are spam, spyware, viruses, and hackers. Consumers in a store may be asked to provide some personal information. As consumers can use cash in stores and are not required to share personal information. With internet purchases, the consumer is required to enter personal information for every transaction, which can be perceived as riskier. Majority of internet users have experienced some type of virus or spyware (Micu *et al.*, 2010). These experiences could result in consumers perceiving online shopping as riskier than in store shopping.

Spyware violates the privacy of online consumers. Invasion of privacy on the Internet involves the unauthorized collection, gathering, disclosure, or other use or misuse of personal information (Wang, Lee, and Wang, 1998; Wills and Zeljkovic, 2011). There has been an emergence of software known as Spyware, programs created both for the covert and overt acquisition of personal information from a personal computer connected to the internet (Sariou *et al.*, 2004).

To avoid the problems of spyware, consumers should not go for downloading free software. A survey (Human Capital, 2009) found that in digital market consumers do not feel hesitate about downloading free music from the Internet. To avoid spyware problems download software only from known and trustworthy sites and don't click on links in pop-up windows or in spam email (CIS, 2012). Promotion focused consumers are more likely to take risks than prevention focused consumers as promotion focused consumers prefer hedonic shopping experiences, whereas prevention focused consumers like utilitarian shopping experiences (Arnold and Reynolds, 2009, Crowe and Higgins, 1997).

While doing online transaction some time unknown software gets installed automatically without user's permission. Malware is basically malicious software; it includes viruses programs that copy themselves without user's permission and spyware programs installed without user's consent to monitor or control their computer activity (FTC, 2008). Sandra (2008) opined companies are concerned with the practices of collecting information of online visitors. Some marketers spy on their users by tracking what they do online. Spyware is installed automatically when known files are downloaded; these files are then inserted on the user's hard drive and send information back to the marketer.

One of the major problems in online market is while downloading the known software unknown software also gets installed on the consumer's computer without consent. One study reported that as many as 80% of computers in the US are spyware infected (AOL, 2004). Moshchuk *et al.* (2006) revealed spyware is a

class of (unknown software) malware that steals or gather private information of users without their permission. Popular examples of spyware include key loggers, programs that monitor web-browsing activity and Trojans that download and install other malware.

Number of times we see while buying online, consumers visit to unknown websites which later on may become the cause of spyware problem. Various applications of the Internet have developed rapidly as more and more consumers surf the web, accessing the information they want through a mere click of the mouse (Micu *et. al.*, 2010).

Spyware installation occurs without prior consent or knowledge of the users. CIS (2012) revealed Spyware is software installed without user's consent that can monitor online activities and collect personal information while user surf the Web. Zhang (2005) warned about spyware; a sophisticated data collection technique, which is downloaded by consumers without them knowing and tracks users' movements on the Web. It monitors users' online activities and triggers unwanted advertisement displays.

Mostly consumers are aware that their computers are affected with spyware and they should take preventive measures. Spyware protection includes some anti-virus software programs. To avoid the spyware problem user should check anti-virus software documentation for instructions on how to activate the spyware protection features and keep anti-spyware software updated and run it regularly (CIS, 2012). Freeman and Urbaczewski (2005) found reasons why people hate spyware and (Zhang, 2005) found consumer understanding of Spyware in terms of their knowledge level. Same revealed by a another study by Qing and Tamara (2005), who believe in the concept of educating PC users to remove complacency that they have over spyware, this research established user awareness factors were most accurate in showing which users took active measures against spyware. Software Inc. (2005) stated that an important and alarming spyware trend emerged, where many home computer users are admittedly afraid of becoming a victim of identity theft from using the Internet.

There must be contract law in downloading and installing fee or paid software. The presence of a marketer's online privacy policy decreases consumers' privacy concerns (Hui *et al.*, 2007; Jensen *et al.*, 2005; Pan and Zinkhan, 2006). Consumers trust e-marketers if they have policies and contract law (e.g., Gefen *et al.*, 2003) and are not afraid of privacy problems with them,



such as e-vendors selling personal information to third parties (Cheung and Lee, 2006).

Spyware has been revealed as major problem as compared to other unethical problems. Spyware is a major threat to personal computer based data confidentiality, with criminal elements utilizing it as a positive moneymaking device by theft of personal data from security unconscious home internet users. It was found respondents treat Spyware as a problem and they have changed their browsing habits (Jaeger and Clarke, 2006).

### **OBJECTIVE AND RESEARCH METHODOLOGY**

To study the perceptions & attitudes of respondents towards spyware issue in E-marketing convenience sampling is used to collect data from individuals who could reasonably interpret the E-marketing and form ethical viewpoint to issues in E-marketing, hence in the present study the those individuals has been included who are educated and exposed to E-marketing. A structured questionnaire was used to collect the necessary data. The survey has been conducted via email and face-to-face interviews. A total of 640 survey questionnaires had been sent out, to which 598 questionnaires received. Each of the responses received has been screened for errors, incomplete or missing responses. Efforts have also been taken to contact the affected respondents through e-mail for clarification and corrections, especially for missing or blank responses. However, responses that had more than 25% of the questions in the survey questionnaire left unanswered or incorrectly answered has been discarded from data analysis. For those responses that had a few blank answers (less than 25% of the questions) and which involved 5-point interval-scaled questions has been assigned with a midpoint scale of 3. After the screening process carried out, only 568 responses have been considered complete and valid for data analysis. This represents a success rate of 94.66%, which is considered to be good in view of time and cost constraints. The location of the present study comprised of the principal districts of Punjab i.e. Amritsar, Jalandhar, Ludhiana or Patiala and Union Territory of Chandigarh. In the study the terms E-marketing, internet marketing and online marketing is used interchangeably and synonymously as it is supported by many authors i.e. Smith and Chaffey (2001), Gohary (2010), Strauss and Frost (2010). So in this study E-marketing is only concerned with marketing through internet.

## ANALYSIS AND INTERPRETATIONS

**Table 1**  
**Consumer's Perceptions of Three Spyware's Factors (Mean, Corrected Item-Total Correlation and Community)**

Variables	Initial	Extraction	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Mean	Std. Deviation
Installed automatically	1.000	.592	.501	.885	3.22	1.525
Downloading free software	1.000	.639	.531	.881	3.21	1.285
Unknown software	1.000	.583	.565	.879	3.34	1.282
Prior consent	1.000	.610	.627	.876	3.34	1.170
Major problem	1.000	.558	.641	.875	3.30	1.120
<b>Overall Mean of "Unawareness" Factor (3.28)</b>						
Misuse personal information	1.000	.697	.605	.877	3.31	1.157
Monitor consumer's visits	1.000	.703	.600	.877	3.35	1.231
Violate privacy	1.000	.696	.688	.873	3.28	1.113
Collects personal data	1.000	.667	.589	.878	3.40	1.129
<b>Overall Mean of "Control" Factor (3.34)</b>						
Contract law	1.000	.732	.667	.874	3.43	1.131
Visit unknown websites	1.000	.682	.602	.877	3.36	1.137
Consumers awareness	1.000	.694	.527	.881	3.43	1.195
<b>Overall Mean of "Unsecure" Factor (3.41)</b>						
<b>Overall Mean of all three Factors (3.34)</b>						

Spyware is an agent technology or software, which is bundled into another piece of software. The strange aspect of this software is that it has often been downloaded by the user, but without his knowledge. The software is basically designed to collect personal information about the user of the computer and relay



this information back to the software manufacturer. In order to examine how the consumers perceived spyware; in terms of Unawareness, Control and Unsecure; the mean scores for all factors have been compared. The findings of respondents' different perceptions for three influencing factors are presented in Table 1.

First, the Unawareness factor has mean score of 3.28 which is less than the overall mean score of 3.34; it implies consumers are not more awarded about spyware problem. Unknown software and prior consent have high mean scores (3.34) within this factor as online marketers install the unknown software in the user's computer without prior consent to collect personal information. It is important to note these items have same mean score as the mean score (3.34) of overall factors. The mean score of present factor is least as compare to others factors. Downloading free software item has least mean score in this factor. The results indicate unknown software get installed automatically without user's knowledge which has become a major problem for Digital market development.

Secondly, respondents rated the Control factor the same mean score as compare to overall mean score of 3.34. This implied that present factor is as important as the spyware ethic for the development of E-marketing. Collects personal data item has highest mean score (3.40) and violates privacy item has least mean score (3.28) in this factor. The mean score of Monitor consumer's visits and collects personal data more than the overall mean score. Spyware has been used by the marketers to monitor or control the consumer's online visits and misusing the collected information which become the cause of privacy violation.

Another factor Unsecure has mean score of 3.41 which is more than the overall mean of all the factors 3.34. In this factor mean score of contract law and consumers' awareness variables have same (3.43) which is more than the mean score of this factor as well as overall mean score. The mean score of present factor is highest as compare to other factors. Consumers feel unsecure online as there is no any specific contract law in case of spyware problem and user's are not aware when unknown software get installed on their computers.

**Reliability Validity and Unidimensionality :** The Cronbach's Alpha of scale is .887 (Table 3) which is good indicator to go ahead as the value of cronbach's alpha coefficient of 0.6 and above is good for research in social science (Cronbach, 1990). Also the corrected-item-total correlation  $> 0.5$  and inter-item correlation is more than 0.3. Here, it is pertinent to mention that corrected-item-total correlation  $> 0.5$  and inter-item correlation  $> 0.3$  (Table 1 & 2) is good enough for reliability of the scale (Hair *et al.*, 2009). The value for communalities

using principal component analysis ranged from .558 to .732 (Table 1). Here, it is pertinent to mention that communalities >0.5 is sufficient for the explanation of constructs (Hair *et al.*, 2009). All these values shows factors analysis has extracted good quantity of variance in the items. Hence, all the requirements of reliability, validity and unidimensionality are met.

According to the scale used if all the 12 items get rating of 5 each, the total score would be 60. The mean score of the respondents is 39.97 (Table 3). The correlation matrix is computed as shown in Table 2. The mean correlation is .406 and it varies from .220 to .640 with a range .420. There is sufficient correlation to go ahead with factor analysis. Factor analysis is done using SPSS software with varimax rotated, Principal Component Analysis. The scale reliability is done for factors so classified. The results are shown in the Table 3.

**Table2**  
Correlation Matrix of Spyware's Variables

	SW1	SW2	SW4	SW7	SW12	SW6	SW11	SW10	SW8	SW3	SW5	SW9
SW1	1.000											
SW2	.622	1.000										
SW4	.305	.406	1.000									
SW7	.376	.396	.640	1.000								
SW12	.408	.392	.490	.523	1.000							
SW6	.228	.299	.362	.350	.355	1.000						
SW11	.289	.269	.300	.388	.304	.636	1.000					
SW10	.323	.311	.379	.443	.467	.587	.624	1.000				
SW8	.219	.265	.347	.381	.443	.564	.568	.592	1.000			
SW3	.378	.343	.383	.432	.510	.452	.389	.489	.398	1.000		
SW5	.315	.303	.332	.365	.400	.407	.407	.516	.357	.619	1.000	
SW9	.282	.297	.284	.330	.441	.306	.344	.376	.310	.552	.487	1.000

Inter-item correlation : Mean = .406, Minimum = .220, Maximum = .640, Range = .420, Max/Min = 2.909, Variance = .011, N = 12

Table 3 shows the factor analysis of the twelve variables; this analysis extracted three factors from the variables. Each factor was defined by at least three scale items. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) value of .886 is sufficient enough for validating factor analysis results. Here, it is pertinent to mention that KMO>0.6 and p<0.5 are good enough for



research in social sciences (Hair *et al.*, 2009). The Bartlett's Test of Sphericity also has a value of  $X^2 = 3068.981$ ,  $DF = 66$ , which are significant ( $p < 0.5$ ) as shown in the Table 3.

**Table 3**  
**Factor Analysis Results for Consumer's Perceptions Toward Spyware Issue in E-Marketing**

Variables	Factors		
	1	2	3
Monitor consumer's visits	.800		
Misuse personal information	.793		
Collects personal data	.775		
Violate privacy	.722		
Downloading free software		.780	
Installed automatically		.726	
Unknown software		.687	
Prior consent		.678	
Major problem		.564	.406
Consumers awareness			.797
Contract law			.754
visit unknown websites			.748
Eigen Value	5.473	1.348	1.013
% Variance	45.610	11.230	8.443
Cumulative % Variance	45.610	56.840	65.283
Scale Reliability alpha	.855	.802	.786

Cronbach's Alpha = .887, Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .886, Bartlett's Test of Sphericity (Approx. Chi-Square = 3068.981, Df = 66, Sig = 0.00, Mean = 39.97

All these requirements are sufficient for validating factor analysis. The three factors classified using the factor analysis is show in the Table 3. All the factors having loading more than 0.4 are considered and the loading ranged from .564 to .800. The three factors so generated have Eigen values ranging from 1.013 to 5.473. The results are validated as shown in Table 4.

The first factor alone has explained 45.610% of the total variation in the factor analysis and might be labeled Control. Scale Reliability alpha of present factor is .855. It includes four variables; i.e. Monitor consumer's visits, Misuse personal information, Collects personal data and Violate privacy. The results indicate marketers do not follow the ethical practices on the internet; they use the unethical procedures to collect the consumer's personal information for their own marketing purposes. With the utility of spyware marketers monitoring the user's visit and misusing the collected information which lead to violation of privacy. The factor loading ranges from .722 to .800. The inter-item correlation ranges from .666 to .718 and item to total correlation ranges from .589 to .688. It covers 5.473 of the Eigen values.

Second factor loaded on five variables. This factor can be labeled as Unawareness as five variables revealed the consumers are not aware regarding Spyware problems and they do not know how to deal with it. The items included in this factor are: Downloading free software, Installed automatically, Unknown software, Prior consent and Major problem. Major Problem item has been loaded on two factor but it has been taken into Second factor (Unawareness) as it has more loading in this factor. This factor has explained 11.230% of the total variation in the factor analysis. The factor loading ranges from .564 to .780. The inter item correlation ranges from .553 to .627 and item to total correlation ranges from .501 to .641. Scale Reliability alpha of present factor is .802 and it covers 1.348 of the Eigen values.

Factor third is correlated with another three variables; i.e., Consumers awareness, Contract law and visit unknown websites. It might be labeled as Unsecure. This category's results indicated that consumers are not aware regarding spyware problem and some time they get involved into unknown websites by mistake which become the cause of insecurity of their personal information, more over there is lack of contract law in Spyware problem. This factor has explained 8.443% of the total variation in the factor analysis and indicates the importance of this factor in online shopping behavior. The factor loading ranges from .748 to .797. The inter item correlation ranges from .592 to .683 and item to total correlation ranges from .527 to .667. Scale Reliability alpha of present factor is .786 and it covers 1.013 of the Eigen values.



Table 4

## Validation of Factor Analysis Results for Factors Affecting Consumer's Perceptions Toward Spyware Issue of E-Marketing

## Correlation Between Summated Scales

Factors	Control	Unawareness	Unsecure
Control	1		
Unawareness	.492**	1	
Unsecure	.417**	.433**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Correlation Between Representative Factors and Summated Scales

Variables/Factors	Control	Unawareness	Unsecure
Monitor consumer's visits	.830**	.406**	.435**
Downloading free software	.315**	.739**	.367**
Consumers awareness	.401**	.421**	.828**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The values for communalities range from .558 to .732. Here, it is pertinent to mention that Eigen value > 1.0 and communalities > 0.5 are sufficient explanations of constructs (Hair *et al.*, 2009). The factor analysis results were valid as the correlation among summated scales and representative variables was high (> 0.5) and it was low among summated scales (< 0.5).

## CONCLUSION

Spyware is one type of malicious software (malware) that collects information from a computing system without consumer's consent. Spyware can capture keystrokes, screenshots, authentication credentials, personal email addresses, web form data, internet usage habits, and other personal information. The data is often delivered to online attackers who sell it to others or use it themselves for marketing or spam or to execute financial crimes or identity theft. Marketing organizations are interested in personal information such as email addresses, online shopping and browsing habits, keywords in search queries, and other personal and trend-related information that can be used to execute marketing campaigns like spam, (unsolicited messages received

via instant messaging systems), browser popups, home page hijacking (changing the default web address for a user's browser), and more. Spyware can cause consumers to lose trust in the reliability of online business transactions. Similar to the problem of counterfeit currency in the physical world, spyware undermines confidence in online economic activity. Consumers' willingness to participate in online monetary transactions decreases for fear of personal financial loss. Vendors lose confidence that the person making the purchase is who they say they are and not actually a criminal using a stolen identity or illicit funds. In efforts to manage the risk, vendors and financial institutions often implement additional verification and other loss prevention programs at increased operational cost.

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