Combating software and hardware piracy

Name

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CHAPTER 1: INTRODUCTION

The advancement in of the information technology, human lifestyle, social and economic structure has been redefined entirely, which in turn has increased our dependence on information and communication technology. According to prior reports, there has been an increase in cases of piracy in the information technology sector. The BSA was formed by software manufacturers, to safeguard their interests. From the BSA study, the volume of pirated software has increased considerably in the last decade as compared to the turn of the century, while among the most of the software used by most of the global enterprises, is a staggering 37% were counterfeits (Lu-Ping & Wen-Chang, 2003). This research also endeavors to prove that the piracy problems have caused a net loss of around 4 billion (Lu-Ping & Wen-Chang, 2003) by software and computer hardware companies in the Asian Pacific region and the rest of the world (group, 2001).This loss turned out as the highest in the world. From the data provided, it is clear that the extensiveness of software piracy has caused massive financial losses. Failure to address the problem, both the software developers, the software companies, software vendors and the information technology IP development program will be majorly affected. So as to eliminate this unethical conduct of piracy, there is need to understand how the behavior can be combated and controlled

PROBLEM STATEMENT

The pursuance of this research becomes relevant as piracy is a vice that causes loss of significant resources to the software and hardware industries, this makes it hard for manufacturers and publishers to recover their investment. Software and hardware piracy causes loss of jobs and their related fringe benefits like revenue to major economies both locally and internationally (Athey, Stern, & national bureau of economic research, 2013).

The economic impact of piracy cannot be ignored as most enterprises do not know that they are largely under-licensed. With decentralized management and other administrative functions including the system to support the large networks, it becomes relatively difficult to establish the use of pirated software by their employees. The ripple effect that results from the use of pirated software has affected almost everyone in the current age in one way or another. For continued research and development, the efforts in creating better software will cause the transfer of liability to the distributors and vendors which are ultimately passed to the end-user. To reduce these economic implications of piracy, there is need to curb this practice completely

PURPOSE OF THE STUDY

This study aims at combating the vice of software and hardware piracy in the computing scene that has currently been on the upward trend.

RESEARCH QUESTION

The research endeavors to solve the following question in combating the menace that is software and hardware piracy

1. Is there a way the BSA can effectively deal with this incessant case of software and hardware piracy?

SUBSIDIARY QUESTIONS

1. What is the main technological advancement so far achieved in combating software and hardware piracy?
2. Is there a way consumers can prevent themselves from the piracy menace?
3. What are the new methods developed by the software and hardware publishers and manufacturers to combat piracy?
4. What is the main contribution of the internet to the fight against software and hardware piracy in this new age of computing?

DEFINITION OF TERMS

Piracy: Piracy is the unlawful obtaining, duplication, distribution and use of any licensed materials like software and computer hardware when it comes to computing.

BSA (Business Software Alliance): an organization in conjunction with governments to advance the software industry.

Enterprise software: this is robust software aimed at serving big corporations and businesses

Intellectual Property (IP): is the creations of ideas, inventions, innovations, artistic and literary works

Copyright: is a legal right created under the law of a given country that will always allow the makers of an original work the exclusive rights to its sale and use.

LIMITATIONS OF THE STUDY

This study majorly aims at exploring the adverse effects of piracy on the industry that is enterprise software and hardware. The enterprise software and hardware has complimented businesses for years now. In some case, the industry has become the mainstay of some industry creating a horde of employment. The enterprise software and hardware industry have been majorly infringed by unscrupulous businesses that do not want to pay for the software and hardware they are using. The software and hardware industry has always depended heavily on copyrights and other Intellectual Property (IP) to drive inventions and innovation while ensuring a return on investment in R&D. Theft of these valuable IPs is significant and growing problem – this undermines the sector's ability to innovate, consequently, limiting growth economically in the respective countries' economies, hence threatening the safety of consumers information. Software piracy is simply put as the unauthorized copying or distribution of copyrighted (licensed) software. The software has different avenues to come to the market; there are a few of routes for piracy. Some of these forms of software and hardware piracy raise challenges

especially to the enterprise software and hardware manufacturers that are unique among the licensed industries and require particular enforcement solutions. The above piracy problems bedeviling the software and hardware industry justify the exploration of enterprise software as a point of interest.

CHAPTER TWO: REVIEW OF THE LITERATURE

REVIEW OF THE LITERATURE

Software piracy is the unlawful duplication of a given venture's developed software and hardware to avoid fees (Straub & RW, 1990). Software and hardware piracy behavior and practices has been largely studied from different angles such as a the use of planned behavior theory, reasoned an equity theory perspective and action theory perspective (AG, 1997), and expected utility theory perspective. Research has also initiated on finding whether given diverse software and hardware piracy practices are unethical. There has been a paradigm shift in piracy due to the advancements in the research done in the software and hardware piracy. There different methods and practices of piracy. The different methods of piracy are as stated:

Corporate user piracy

The software and hardware (enterprise) sectors are crippled by the form of piracy involving ultimate end users copying of software without authorization. This practice can include employees using a copyrighted copy to install and use on the different workstation hence leading to the usage of software on multiple stations on the same network while others copy disks for local use and distribution. This practice also allows taking advantage of updates and other fringe benefits without possessing the legal master copy of the version requiring an upgrade or the hardware requirement, or the movement of disks in or outside the organizations designated premises. Over-use of a master copy of a certain program within an organization's distributed network is another matter of major concern. While these forms of piracy do not majorly involve resale or commercial gains from the sale or distribution, they nonetheless reduce the revenues due to the manufacturers and provide gains to the final users as they can save by not paying for legitimate software licenses. Organizations end-user piracy is a significantly different form of piracy problem that is treated in varied ways, from the other practices like counterfeiting. In this case, legal action is taken against the end user rather than a publisher or reseller. Hence, the software and hardware industry depends solely on civil remedies to be able to take action against respectable companies. Leveling suits against such corporate become a colossal problem.

Hard-disk loading

The other piracy problem that bedevils the software and hardware industry is when makers of PCs ("original equipment manufacturers" or "OEMs") or vendors of computers and servers install illegal duplicates of software on these devices to increase the sale of the equipment. This practice would ultimately increase the proceeds obtained from the devices

without any added costs to the resellers while failing to remit loyalty to the software hence this a major form of exploitation. Preventing this form of piracy comes with different challenges. To establish that software has been duplicated relies on a test purchase of a PC, or in cases where there is a raid on a computer warehouse. These surprise attacks are an essential tool if well implemented. But proving a particular number of illegally obtained copies or hardware can be difficult, especially in cases where the software is copied when a customer buys a computer or in case of poor record keeping by the reseller. Like other rights holders, the software and hardware industry also suffers substantial harm from piracy over the internet and from fake copies of the software.

<p style="text-align:center">Internet Piracy.</p>

The most people and businesses usually make use computer systems and the internet for very legitimate personal, commercial and educational reasons. As the web increases opportunities to communicate, do business and learn it also provides new opportunities to duplicate and counterfeit software and hardware components. Software was the first computer technology that is copyrighted to be digitized, and this fact has contributed to the fight against internet piracy in the software industry to be the longest. BSA has for the longest carried out a massive, global online anti-piracy sensitization program that has involved a case of takedown notices and civil litigations while carrying out successive public awareness campaigns. Internet piracy is composed of several distinct form of online infringement activities. Unauthorized distribution of licensed software through P2P/Bit Torrent networks has always remained a major problem included also is the provision of software for free in pirate sites.

Counterfeiting

This type of piracy occurs in cases of software, where it is a norm to find cheap knock off copies of disks containing the software and licensed hardware components, as well packaging and other different after sale services. Counterfeiting has been a major problem for the computing industry, developments in technology have sparked a growth in the variety of commercial ventures to maximize on counterfeiting of software. Due to the lenience of the punishments to these vices, the software and hardware industries are seeing a resurgence of this activity.

CHAPTER THREE: METHODOLOGY

METHODOLOGY

While enough research has been done on ethical implications of software and hardware piracy, there is still need for making models to gather information from the existing materials and certain chosen subjects. Studies have been carried out to explore the issue of piracy in the computing world, but no one has yet attempted to study software and its parallel relationship with the hardware in ethical models to understand piracy. The study of a general ethical model on piracy may reveal the characteristics responsible for the decision made so to pirate software. Ethical models in the study of piracy are comprised of cognitive and moral progress criteria that are used to evaluate the ethical issues associated with software piracy in the need to make an

informed judgment about this matter. The following methods were applied in data collection and analysis.

Questionnaires

The questionnaire will be distributed through the Internet and physically to chosen respondents, the questionnaire aimed at obtaining the necessary information of users, and then continuing with the randomly selected ones. The reason for selecting the on-line method of administering questionnaires is the desired characteristics of web users being entirely familiar with downloading software from the Internet, and the Internet being an avenue for software piracy. The questionnaire will be hosted on a web page specifically designed for this research. Incentives like provision of wallpaper as a gift to respondents, to increase the probability of respondents. The web questionnaire will be set up and for data processing, the web Pages will be designed using WordPress. IIS will be utilized to build the backend and the on-line questionnaire system, and data will be stored in a database designed using Access or MySQL. The web user will find it very easy to answer in the online system. After the filling of the web-based questionnaire, physical questionnaires will be administered to students and other willing parties. This system will be used in different web browsers, but simultaneously with multiple on-line users to test and ensure the reliability of the whole system in different operating systems and web browsers. The time used for responding to the questionnaire will be measured. Using the data gathered, the thoughts and the perceptions of most of the web respondents on software piracy can be better evaluated and understood. This research will not be discriminatory to the Internet users, which would include IT personnel, students, and the non-IT related working people.

Measurement

This method will present the data obtained from analysis of the following, software pirating attitudes, associating with software pirating peers, little self-control, and computer use, and measures used to control moral beliefs toward piracy.

Software and hardware piracy

The dependent variable for the research will be identified in concern to taking computer applications for personal use and also give access to other people (Shore, et al., 2001, p. 23). The individuals responses would be measured on against the probability that they would take part in the behavior on a five-point scale (1 = not very likely to 5 = very likely). The responses would be such that higher scores signaled higher probability and vice versa.

Low self-control

This method will measure the ability of individuals to avoid software or hardware piracy solely on their own rather than succumbing to the pressure generated from those who indulge in such practices. The research will include the measure of the individual tendencies using the gauge that one firmly disagrees while four strongly agree.

Associating with deviant peers

The method will assess the effect being in association with pirating peers using a composite of six items (Krohn, Skinner, Massey, & Akers, 455-473, p. 32).The following questions were asked to the individuals:

1. How many of their friends practice software piracy

2. How many of their friends most notorious in copying software.

The individual answers were limited to the following choices (1 = none of my friends, 2 = one of my friends, 3 = two of my friends, 4 = three of my friends, 5 = four or more of my friends). The higher the score, the higher the probability of association.

Moral beliefs toward software piracy

The study appealed to the morals of the individuals provoking them to assess the evils of piracy and their views towards it. A like-type scale was used to measure the morals of the respondents. A Higher score on these items from these individuals signaled stronger beliefs that indulging in piracy is wrong.

Computer use

The study used a composite of several items to deduce the individuals' computer use. These involved inquiring about the respondents' interaction with computers (e.g., word processing, spreadsheets, and databases), e-mail and the Internet. The answers from the individuals were categorized as: 1 = never, 2 = sometimes, 3 = often, 4 = a lot. Individual responses were analyzed in a dichotomy that had a range of 1 to 3.

Demographic measures.

The population related items measurements for the study were the individual's age and sex. These factors were used as controls in the statistical analysis of the vice and its influence on the population.

CHAPTER FOUR: DATA ANALYSIS-RESULTS

DATA ANALYSIS-RESULTS

This study aims at combating the vice of software and hardware piracy in the computing scene that has currently been on the upward trend.

The central part of the research was to establish ways in combating software and hardware piracy with the advancement in technology. The methods applied so far used include

Software Locks

Software and hardware piracy have changed with the changes in computing. Piracy in computing was not an issue in early years of computing as there were few computer owners and users, software customers. Most things have changed in the new software economy. The many poor customers have been able to access software that was rather expensive for them. Software locks were introduced in an attempt to curb this vice of software piracy, not punishing the practice. The lock is designed to minimize access while restricting the use of the program illegally. The locks are breakable like any other, but the intention is that to make it cheaper to purchase the software than going the extra mile to crack the lock.

Dongles

One of the most efficient software lockings is the use of systems consisting of a physical lock known as a dongle. For costly software, it is usually economical to sell the software together with a hardware lock. The primary use of the lock is for the application to be able to verify its existence. As most software and their secrets are easily duplicated, hardware poses a problem when it comes to duplication. Dongles have been used for a good period and their use in the protection of software against piracy but this would not solve the problem completely (Dana, Nathan, Daniel, Roemer, & Schear, 2006, p. 23).

1. What is the main technological advancement so far achieved in combating software and hardware piracy?

<div align="center">Software Validation and the DMCA</div>

Many DMCA cases have been majorly concerned with the digital media content protection; the DMCA scope covers up to digital denial of access to software. Vendors that sell these tools that aid in the circumvention of application validation process may also be faced with a liability case, even when the breach is only a small part of the whole distribution of the program. For example, the developers of bnetd, community software that enabled users of Blizzard games to connect their computers so as to play games by by-passing Blizzard's servers. These developers were found to be liable for this software breach as their software did not respect Blizzard's built-in feature in their software. The software validation and DMCA have been used still and are being used so as to curb these practice (Dana, Nathan, Daniel, Roemer, & Schear, 2006).

<div align="center">Cryptography</div>

This is the practice of encrypting and decrypting the code that forms the framework of a given software. This practice is used so as to avoid supporting update for the illegal software.

Hence, there was the need to diversify the different interfaces for updating and the distinct files so as to ensure that a file in an update cannot function in illegitimate programs. The data file can also be encrypted and decrypted using distinct keys. These techniques can be used for most of the interface in code files, so as to encrypt the value returned by functions. These decrypting keys could be hidden in using white-box cryptography (chow, Eisen, Johnson, & Van Oorschot, 2003) hence making it harder to bypass this protection.

Is there a way consumers can prevent themselves from the piracy menace?

To curb these menace, it is majorly a personal initiative. The customers must by will avoid their peers who are known to be notorious in using pirated material. The customers in most case should be able to report such case to be able to curb the vice.

CHAPTER FIVE: CONCLUSIONS

This study aims at combating the vice of software and hardware piracy in the computing scene that has currently been on the upward trend.

Summary

This research paper cited the schemes used in the protection of software and hardware malicious use and distribution. The strength of the study is on the diversity of the new methods herein advanced. The paper from the questionnaire that is anonymous was able to obtain the different ranges of piracy and hence discussed the relevant approaches usable in curbing the vice.

Conclusions

Computer software is essentially an integral aspect in the unique custom-built systems that is the computer hence evolving into a commoditized good. These advancements have not been with a lot of challenges to the publishers and the manufacturers. The need to ensure an economic return to these parties' laws has been instituted while making the market unfavorable for pirates. The moves have brought many stakeholders so as to shun the vice entirely.

Significance of the Study

There has always been the need to ensure the economic return of the player in the software and hardware scene, so, therefore, this study aim at exploring the different applicable ways in curbing piracy.

Suggestions for Further Research

With the advancement in technology, there is will be needed for researchers to look into the software sharing through P2P networks so as to reduce the number of pirated software.

In the case of hardware, research is encouraged in the field of hardware assembly so as always to give a manufacturer credit for his work.

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