Ethical and Legal Perspective of Software Piracy and Business Effects on the Illegal Use of Peer-to-Peer Systems Architecture

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ABSTRACT
This is descriptive survey research aims to investigate the ethical and legal perspective of software piracy and use of P2P Systems architecture. It sought to answer the profile of the respondents regarding the program, age and year level of the respondents, the attitudes of the respondents regarding software piracy and the attitudes of the respondents regarding the use of Peer to Peer Systems Architecture. The respondents are also asked about the reason for using the P2P and pirate software. The result of the respondent's shows that majority of the respondents agree that software piracy is acceptable. While most of the respondents agree that piracy is accepted, most of the respondents sometimes practice piracy because of the high cost of content and respondents does not want to pay for it. Based on the result, it is recommended that content providers should increase the security of content to avoid loss of profit..

General Terms
Peer-to-peer (P2P) systems architecture is a distributed application architecture that partitions tasks or workloads between peers, there is no server between peers.

Keywords
P2P, business ethics, legal practices

1. INTRODUCTION
Due to the increasing technological advantage, acquiring information is more accessible than before, and piracy becomes a subject of great interest in the past years. P2P applications and more specifically BitTorrent, an application that is being daily used by millions of users [1], Today's reality is that BitTorrent is one of the most used protocols on top of Tor (with HTTP/HTTPS) in terms of traffic size and number of connections [2], and it is the commonly used P2P systems architecture for piracy.

The researcher would like to know if there are changes in attitude from the older generation up to the millennials. Several studies conducted regarding software piracy since the 1980s. Christoph, Forcht, and Bilbrey published a study in 1987 and concluded that prior computer knowledge made no significant difference in their attitudes toward piracy [3]. Cohen and Cornwell also replicated the study by Christoph et al. last 1989 and added additional questions asking respondents whether they had engaged in software piracy and whether they consider it legal. [4]

1.1 Statement of the Problem
This study will answer the following question. (1) What is the profile of the respondents regarding program, age and year level of the respondents? (2) What are the attitudes of the respondents regarding software piracy (3) What are the attitudes of the respondents regarding the use of Peer to Peer Systems Architecture? (4) What is the respondent's reason for using P2P and pirate software, if any?

The scope of the study does not include the correlation between the attitude of respondents regarding software piracy and use of the Peer to Peer Systems Architecture and the profile variables. It is recommended in the future paper that will discuss the significant difference between the attitude of the respondents across the practice of the respondents towards piracy and use of P2P Systems Architecture

2. P2P SYSTEMS ARCHITECHTURE
Unlike in other patterns, peers play a vital role in P2P. Peers are equally privileged, and equal participants in the application. Peers are said to form a peer-to-peer network of nodes. To define the architecture itself, Peer-to-peer (P2P) systems architecture is a distributed application architecture that partitions tasks or workloads between peers, there is no server between peers.

In this literature review, the proponent looked at the limitations and advantage of the systems architecture pattern and where it is applicable. Client/Server Architecture is well known, powerful and reliable server is a data source, while C/S Architecture is used in file sharing, several limitations have been recorded such as the use of traffic, P2P Systems addressed several limitations. Since clients are also servers and routers, P2P Computing shared its resources directly to the peer, these resources and services include the exchange of information, processing cycles, cache storage and disk storage for files [14]. P2P computing takes advantage of existing computing power, storage, and network connectivity, allowing users to leverage their collective power to the benefit of all.

Despite the advantage of P2P, too many people believed, the use of Peer to Peer or specifically the BitTorrent client is synonymous with piracy. [5] If P2P systems architecture will shut down, many content creators would have the scramble to look for alternatives. Like HTTP, which browsers use to communicate or connect to a website, P2P and BitTorrent is just a protocol. HTTP and FTP can also download pirated content just as we can do with P2P, but P2P is probably primarily used for uploading and downloading unauthorized content. Many organization used BitTorrent client as a way to update software such as game update; it uses the build in BitTorrent client in the game launchers to automatically downloads it for us. Even Facebook and Twitter used BitTorrent to transfer large files from each server [6] to

propagate large files over a large number of different servers. Technically based on the sources, P2P is not illegal, it is just a protocol for data transfer. However, how come the perception of many to P2P is illegal? It is because of its probably primary use for downloading an illegal content because it is unmonitored for decentralized P2P.

Typically, the majority of P2P traffic is related to copyrighted material [7] and other files. This is to conclude that sharing of files is legal, but sharing a copyrighted file without authorization is illegal. Legality always depends on the user itself.

3. METHODOLOGY

Some part of the questionnaire used was adopted from the study of Cohen and Conwell [4]. Instead of using the questionnaire as is, the proponent modifies the question and added several questions relating to the use of Peer to Peer to achieve the result of the study. The respondents were also asked about their attitude and usage about privacy, and the use of others. They were not asked to categorize themselves by race or any identifying information, but the program, sex and year level was included in determining if there is a relationship. To maintain the anonymous of the respondents, personal information was remove in the survey questionnaire.

Google forms were used to float the questionnaire. The respondents are the students of one state university from 3 campuses mostly are Business Administration students and Information Technology Students. Convenience sampling was

used in determining the respondents, it is is a non-probability sampling technique where subjects are selected not only because of their convenient accessibility and proximity to the researcher but to determine if there is a significant relationship across the course or program of the student. Questionnaires were numbered after collection too, and the answers were tabulated using a spreadsheet.

4. RESULTS AND DISCUSSION

The result answers only the profile of the respondents regarding the program, age and year level, the attitudes of the respondents regarding software piracy, the attitudes of the respondents regarding the use of Peer to Peer Systems Architecture, and the respondent's reason of using the P2P and pirate software.

Based on the Profile of the respondents, there are 65% female and 35% male, Majority of the respondents are 19 years old with 48.3% followed by 20 years old with 16.7% and 11.7% for 18 years of age.

4.1 Attitudes of Respondents in Software Piracy and Peer to Peer usage

Based on the result of the survey, 53.45% of the respondents agree that software piracy is okay. While 42.92% does not agree on piracy. It is visualized in the table below the attitudes of the respondents in a statement shown below. Those statement with more than 50 percent who agree is marked in red to emphasize the result of the majority.

Table 1: Attitudes of Students in Software Piracy

Statement	Yes		No		Unsure	
I think it is okay... [for people such as myself to copy commercial software instead of buying it.]	49	81.67%	9	15.0%	2	3.3%
I think it is okay... [for people such as myself to copy commercial software instead of buying it when we use it for educational purposes.]	50	83.33%	9	15.0%	1	1.7%
I think it is okay... [to use another student's computer account without the student's knowledge.]	3	5.00%	56	93.3%	1	1.7%
I think it is okay... [for a user to use the University's computer for non-University activities.]	9	15.00%	46	76.7%	5	8.3%
I think it is okay... [for a student to look at, but not change, confidential student records.]	15	25.00%	39	65.0%	6	10.0%
I think it is okay... [for a student to look at and change confidential student records.]	9	15.00%	49	81.7%	2	3.3%
I think it is okay... [for students to work together on individual computer assignments.]	36	60.00%	22	36.7%	2	3.3%
I think it is okay... [for students to give a copy of their work to another student to hand in.]	19	31.67%	35	58.3%	6	10.0%
I think it is okay... [for two students to share the work for a computer assignment and each hand in a copy.]	33	55.00%	25	41.7%	2	3.3%
I think it is okay... [for a user to copy commercial software for personal use and share it with others.]	35	58.33%	23	38.3%	2	3.3%
I think it is okay... [to download commercial software from Torrent and use Crack to use it]	23	38.33%	34	56.7%	3	5.0%
I think it is okay... [to copy software and install it on my computer with crack or keygen.]	22	36.67%	34	56.7%	4	6.7%
I think it is okay... [to watch downloaded movies rather than to watch in the cinema or buy the original movie.]	48	80.00%	12	20.0%	0	0.0%
I think it is okay... [to use torrent and another P2P client to download entertainment]	26	43.33%	27	45.0%	7	11.7%
I think it is okay... [to copy movies from others electronic media (such as HD or SDcards)]	52	86.67%	7	11.7%	1	1.7%
I think it is okay... [to copy music from others electronic media (such as HD or SDcards)]	53	88.33%	7	11.7%	0	0.0%
I think it is okay... [to ask my friend or myself to send me movie thru my mobile unit]	50	83.33%	9	15.0%	1	1.7%
I think it is okay... [to ask my friend or myself to send me music thru my mobile unit]	50	83.33%	10	16.7%	0	0.0%
I think it is okay... [to download research paper and use the copy-paste method and submit to my teacher/instructor.]	19	31.67%	38	63.3%	3	5.0%
I think it is okay... [to copy from the website and other online resources for my project.]	32	53.33%	24	40.0%	4	6.7%

It is visible in the figure that Software Piracy is acceptable as visualized in the figure. The blue marks agreement that software piracy in the statement is acceptable. This shows that majority of the respondent's attitude towards software piracy and uses to P2P illegally is still acceptable.

The result of the study supports the evidences from study of Acilar [17] that many undergraduate students consider software piracy and other unethical use of information technologies as an acceptable behavior. It is also observed by the researcher that most of the students stored music in there laptop and mobile device but didn't paid for the content.
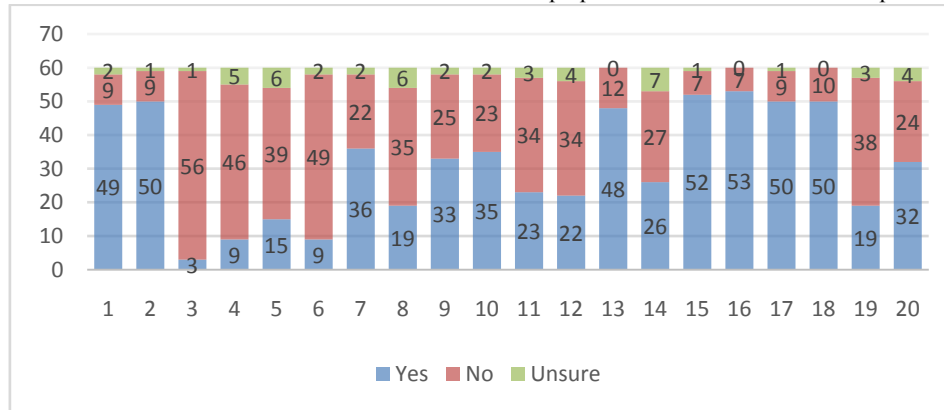

Figure 1: Distribution of Attitude in Software Piracy

4.2 Practices of Respondents in Software Piracy and Peer to Peer usage

Despite a high agreement in software piracy, only 27.60% of the respondents are always practicing software piracy. While 39.90% sometimes do illegal actions. There is an average of 32.5% of the respondents are not practicing piracy. It is visualized in the table below the practice of the respondents. Those statement with more than 50 percent who agree is marked in red to emphasize the result.

Table 2: Practice of Students in Software Piracy

Statement on Practice.	Always		Sometimes		Never	
I tried to... [copy commercial software instead of buying it.]	24	40.00%	26	43.33%	10	16.67%
I tried to... [copy commercial software instead of buying and use it for educational purposes.]	27	45.00%	23	38.33%	10	16.67%
I tried to... [use another student's computer account without the student's knowledge.]	5	8.33%	10	16.67%	45	75.00%
I tried to... [use the University's computer for non-University activities.]	8	13.33%	16	26.67%	36	60.00%
I tried to... [look at, but not change, confidential student records.]	6	10.00%	16	26.67%	38	63.33%
I tried to... [look at and change confidential student records.]	5	8.33%	10	16.67%	45	75.00%
I tried to... [work together on individual computer assignments.]	12	20.00%	38	63.33%	10	16.67%
I tried to... [give a copy of their work to another student to hand in.]	7	11.67%	38	63.33%	15	25.00%
I tried to... [share the work for a computer assignment and each hand in a copy.]	9	15.00%	36	60.00%	15	25.00%
I tried to... [copy commercial software for personal use and share it with others.]	15	25.00%	30	50.00%	15	25.00%
I tried to... [download commercial software from Torrent and use Crack to use it]	7	11.67%	26	43.33%	27	45.00%
I tried to... [copy software and install it on my computer with crack or keygen.]	13	21.67%	17	28.33%	30	50.00%
I tried to... [watch downloaded movies rather than to watch in the cinema or buy the original movie.]	32	53.33%	21	35.00%	7	11.67%
I tried to... [use torrent and another P2P client to download entertainment]	13	21.67%	21	35.00%	26	43.33%
I tried to... [copy movies from others electronic media (such as HD or SDcards)]	29	48.33%	26	43.33%	5	8.33%
I tried to... [copy music from others electronic media (such as HD or SDcards)]	32	53.33%	24	40.00%	4	6.67%
I tried to... [ask my friend or myself to send me movie thru my mobile unit]	30	50.00%	24	40.00%	6	10.00%
I tried to... [ask my friend or myself to send me music thru my mobile unit]	31	51.67%	25	41.67%	4	6.67%
I tried to... [download research paper and use the copy-paste method, and submit to my teacher/instructor.]	11	18.33%	25	41.67%	24	40.00%
I tried to... [copy from the website and other online resources for my project.]	15	25.00%	27	45.00%	18	30.00%

It is visible in the figure 2 that Software Piracy is still practiced as visualized in the figure. The blue marks are always practicing software piracy. This shows that majority of

the respondent's practice software piracy and uses to P2P illegally sometimes.
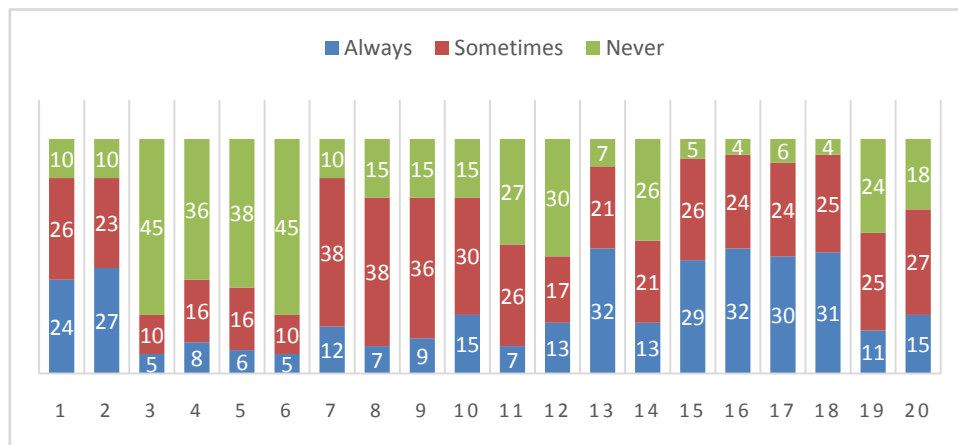

Figure 2: Distribution of Practice in Software Piracy

Based on the figure 3, the higher the level of the attitude, the higher the level the practice. The relationship between the attitude and practice shows that student will more likely to practice the statement if the respondents believe that it is

okay. The result support the study of Ming, et.al. that personality traits are said to be an effective positive influence on unethical behavior. [18]
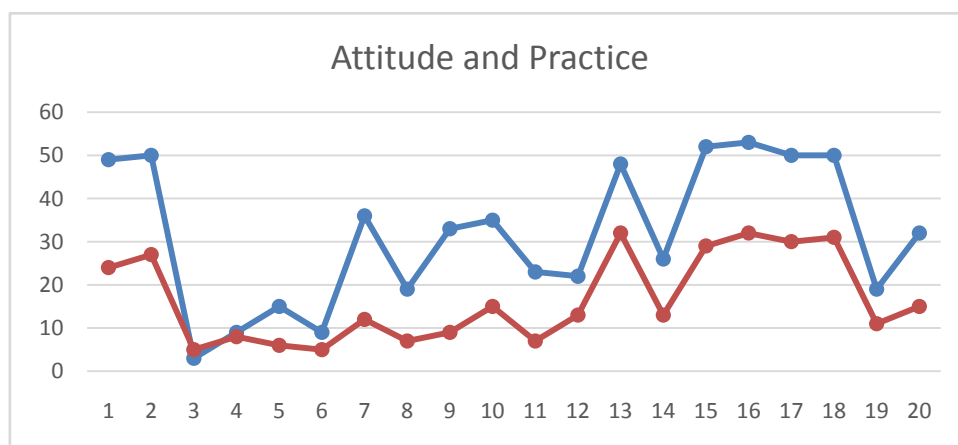

Figure 3: Graphical Relationship between Attitude and Practice

4.3 The reason of the Respondents in using piracy

Based on the result of the survey, 80% of the respondents practice piracy because they can't afford the content. Followed by 48.3% with the reason that the respondents don't like to pay for it. 35% of the respondents find it hard to purchase, and 21.7% says that "others are doing it too." It shows that the main reason for piracy is the respondents cannot afford original content and doesn't want to invest money in the content. The result of the study implies that the estimated losses for the software industry are approaching more than $60 billion [15], thus the main reason why software industry failed to earn money is because the users doesn't want to spend for the content, in this regard, the only way to avoid losses is to fight piracy [16].

4.4 Effects of Piracy in Business and Ethics

Piracy hurt the business industry so much, it does not only affect the profit of an organization, but it also affects the ethical perspective and practice of human. While the business of the software company vendors and content creator are the

victim of the growing epidemic, [9] manufacturing company are also affected. In this study, it investigates the practice and attitude of the respondents to determine the impact in the business world and provide a recommendation.

Another practice that is visible in the Philippines is internet hacking. It is an act of accessing the internet without paying for service. In a global study called Digital in 2018 [11], Most of the Filipino spent an average of 3 hours and 57 minutes every day on social media in the year 2017. Users have grown by 27% in the past year. The Philippines is known as the texting capital of the world [9], and also a social media capital of the world [10]. It is widespread in the Philippines that internet users are selling VPN to access the internet illegally. Virtual Private Network [12] itself is legal because it provides users an anonymously use of the network, while the telecom in the Philippines forbid the use of such network illegally. There are some reports from one telecom in the Philippines for such entrapment operation of illegal sellers of modified network modems as an illegal modus operandi [13]. Despite the fact that authority imposed a cybercrime law in the

country, it is still a challenge to aim for its full implementation.

5. CONCLUSION AND RECOMMENDATION

The study shows a relationship between the attitude of respondents regarding software piracy and use of the Peer to Peer Systems Architecture. It is visible in the result that software piracy is acceptable from the respondents, and the higher the level of attitude, the higher the level of practice. It is concluded that despite the acceptability of software piracy, money is still the main reason why respondents are practicing piracy. There is no reason that piracy is acceptable in the field of business and technology. The researcher may conclude that security imposed by the developers are the only solution to avoid software piracy. Thus it is recommended that developers and business owners should maximize the security of their content to avoid the pirated copy

6. ACKNOWLEDGMENTS

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