# GUIDELINE TO ENCOUNTER SOFTWARE PIRACY AMONG MALAYSIAN INSTITUTE OF HIGHER LEARNING STUDENTS: A CASE AT UNISEL

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## Abstract

*The negative impact of software piracy is not only to software companies through lower profits but also to customers through higher prices. In prior research scholars have argued that software piracy can be reduced by increasing the moral intensity of pirated software on the individuals. But with the higher price of digital assets, and most students do not have a regular income will tend to commit software piracy. This is why the need for a comprehensive guideline is very much needed to help in reducing the number of software piracy among students. Questionnaires are developed and distributed to students from 8 faculties which comprises of undergraduates and postgraduates programs. The result is a guideline to software piracy among university students particularly the Unisel students. This guideline is hoped to help reducing the cases of software piracy among students thus benefits the universities and the software companies.*

*Keywords*: Guideline, Software Piracy, Institute of Higher Learning

## 1    INTRODUCTION

Today's ICT and software industry is a large and growing driver of Malaysia economy. However, in the business world that has strong relationship with Information and Communication Technology (ICT), there are an increasing number of trends which have led to the increase of unethical behavior. Software piracy is one of the unethical behaviors and it can be categorized as one of computer crime. Software piracy cases among Malaysian IHL students can affect in terms of student's moral, ethics and IHL ICT resources. Many social problems can arise from the uncensored pirated software.

The study will contribute to investigate the current situation on the software piracy among Malaysian IHL students and propose or/and enhance guidelines to encounter the software piracy problems.

## 2    BACKGROUND

Software piracy is becoming economically devastating to companies that develop and market software. It has negative effect on this country's economy, with millions of dollars in lost tax revenues each year. Currently, Malaysia piracy rating in 2011 is 55%. Compare to Asean countries, Malaysia pirated rating is better than Thailand (72%) and Indonesia (86%) but lower than Singapore (only 33% piracy rating). Besides software piracy impact on economy, software piracy also affects youth and children morale and ethics. Easy access to pirated software through online access expose youth and children to online threats such as exposure to inappropriate images or content and various virus attacks. According to Kini et. al (2004), further research had to be done to study student perceived moral significance regarding software piracy. Many studies have found that differences between attitudes about software piracy and demographic variables exist in varsities. Specifically, differences in career orientation (IS faculty versus other faculty) and gender appear to partially account for different attitudes and practices regarding software piracy and softlifting (illegal copying of software by individuals for personal use but not for resale as in software piracy, is expected to be equally prolific as software piracy) (Kini and Anna, 2000). In the case of university students, they felt that many unethical activities were ethical because they saw them happening every day (Kini and Anna, 2000).

The results of this study will be useful to develop policies to control software piracy. This research will investigate the perception of software piracy among Malaysia Institutes of Higher Learning's (IHL) students, evaluate the software piracy impact on student's moral, ethics and IHL ICT resources and proposes a guideline to encounter software piracy in Malaysia IHLs.

### 2.1  Objective

The objective of the research is as follows:

- To investigate software piracy cases among Malaysian IHL students.

- To evaluate the software piracy impact on student's moral, ethics and IHL ICT resources.

- To propose or/and enhance guidelines to encounter the software piracy among IHL students.

## 2.2 Scope

The scopes of this research are as below:

a. The unit of analysis for this study is the software piracy cases that happen among Malaysian IHL students.
b.. The target respondents are as follows:
   i. Students
   ii. University – HEP, CICT, Top Management, Hostel Management, Security
   iii. Faculties – Faculty Management Representative, Academician

## 3    LITERATURE REVIEW

The research framework adopts the term 'digital product' refers to any products that can be digitalized, such as software, audio, video, books, and pictures. Such products are very popular in online and mobile businesses since the distribution costs are significantly lower than in conventional distribution. However, digital products are vulnerable to pirate (Budi, S., Fandy, T., 2013).

The software industry reports a slowly declining rate of piracy in Malaysia, although it notes higher piracy levels outside the main business regions due to lack of attention on the issue and fewer complaints lodged.10 BSA ran 60 criminal end-user raids and 1 civil end-user raid in 2013, up from 53 actions in 2012. Most of the companies recently raided are under licensed as opposed to having no licenses at all, which is a positive sign of increasing copyright awareness. It is believed that the public sector is also highly under-licensed, although lack of statistics and transparency has hampered efforts to confirm this. (http://www.iipa.com/rbc/2014/2014SPEC301MALAYSIA.PDF)

### 3.1 Software Piracy

Software piracy is part of digital piracy. Digital piracy is defined as illegal downloading and/or copying of copyrighted digital products, such as software, video, and audio files (Al-Rafee & Cronan, 2006; Cronan & Al-Rafee, 2008; Yoon, 2011). Digital products that have been pirated heavily are software (programs, games), audio products (music, recorded speech, tutorials, conversations), video (movies, video clips, recorded concerts, television shows), books (e-books, magazines, journal articles), and pictures (images and photos) (Budi, S., Fandy, T., 2013).

There are five common types of software piracy, end-user piracy, client-server overuse, internet piracy, hard-disk loading and software counterfeiting. The first type of software piracy, end user piracy occurs when a company employee reproduces copies of software without authorization. The second type of software piracy, client-server overuse piracy occurs when too many employees on a network are using a central copy of a program at the same time. Installing programs on the server in a local-area network must not exceed the entitled number of licenses. If more users use the software more than allowed by the license that is known as "overuse".

The third type of software piracy, Internet Piracy occurs when software is downloaded from the Internet where pirate websites that make software available for free download or in exchange for uploaded programs. The fourth type of software piracy is hard-disk loading occurs when a business who sells new computers loads illegal copies of software onto the hard disks to make the purchase of the machines more attractive. The same concerns and issues apply to Value Added Resellers (VAR) that sell or install new software onto computers in the workplace. The fifth type of software piracy is software counterfeiting. This type of piracy is the illegal duplication and sale of copyrighted material with the intent of directly imitating the copyrighted product. In the case of packaged software, it is common to find counterfeit copies of the CDs or diskettes incorporating the software programs, as well as related packaging, manuals, license agreements, labels, registration cards and security features.

Beside common piracy of traditional software, mobile app market also has been plagued with piracy. Although the piracy rate differs by apps, the rate in general ranges from 60% to 90% (Amitay, 2011; Kharif, 2012; Rose, 2012; Hoon et al., 2014).

Research on software piracy usually focus on factor of software piracy (Bagchi et al., 2006; Limayem et.al, 2004; Gobal and Sanders, 1998), impact of software piracy (Fretz, 2012;Vinod & Santhosh, 2011; Livingstone, 2002) and how to solve software piracy (Fretz, 2012; Moores, Nill, & Rothenberger, 2009; Gopal & Sanders, 1997).

### 3.2 Factors of Software Piracy

There are several factors that encourage user to practice software piracy. Among the factor are gender, age, ethical attitude (Gobal and Sanders,1998); cultural factors (Limayem et.al, 2004), high media prices, low local incomes, slowly rising incomes, fast technological

diffusion and also because fast-changing consumer and cultural practices.

Bagchi et al.( 2006) had categorized the factors of software piracy into four main categories. The categories are economic factors, technical factors, regulatory factors, social/cultural factors. The economic factors are software price, and gross domestic product per capita (GDP). The technical factors are concerning weak IT infrastructure, low software quality, copy and work with pirated software. The regulatory factors are regarding developing countries unintentionally encourage software piracy by impose high tariff which increase software price. The social/cultural factors covers collectivistic societies in developing countries as software purchased by individual is expected to be shared among members.

## 3.3 Impact of Software Piracy

Many people believe use of unlicensed software or purchasing illegal software only harms software creators. However, the damage caused by the software piracy goes much further. It affects jobs, wages and retail sales across the country. It also has a negative effect on this country's economy, with millions of dollars in lost tax revenues each year (Hoon et.*al*, 2014; Wallace, n.d.; Haque et.*al*, 2009; Moshe et. *al*, 1995). Pirated software hurts everyone from the software developers, retail store owners, and ultimately all software users. End user or corporate copying makes or uses illegal copies of software for personal use or at work in a business is a civil wrong under the Copyright Act. This action also can affect company reputation.

Furthermore, the youth that downloaded pirated audio, video and games online are expose themselves to online threats (Fretz, 2012; Vinod & Santhosh, 2011; Livingstone, 2002). Examples of online threats are exposure to inappropriate images or content, whether inadvertently or deliberately, solicitation by sexual predators in chat rooms, other forms of social media, and by email, pornography image and video; expose to spyware, viruses and malicious software attack and temptation to engage in piracy of software, music or video.

## 3.4 Software Piracy in IHLs

Several studies on software piracy had been conducted in Institutes of Higher Learning (IHLs) (Konstantakis et. al, 2010; Al-Fadhli, 2009; Teston, 2008; Gan & Koh, 2006; Liang & Yan, 2005; Higgins & Makin, 2004; Kini et. al., 2003; Kini et. al, 2000; Rahim et. al, 1999).

According to Higgins & Makin (2004), low self-control does have an effect on software piracy and that social learning theory measures (i.e., associating with several deviant peers and high levels of positive attitudes toward software piracy) condition this effect. Kini et. al,

2000 studies found out moral intensity of any student is significantly related to the perceived level of moral intensity of other students.

Moral intensity is consist of six components (Masrom et. al, 2010): 1) magnitude of consequences – the aggregate harm or benefits of the act; 2) social consensus – the degree to which others think the act is good or evil; 3) temporal immediacy – the length of time between the act and its consequences; 4) probability of effect – the likelihood that the act will cause harm or benefits; 5) proximity – the social distance between the decision maker and those affected by the act; 6) concentration of effect – the number of people affected by the act.

Konstantakis et. al, 2010 research finding shows computer science students in Greece make intensive use of pirated software because of the high cost of genuine software, academic environment and their student status. Even though they acknowledge the immoral character of their actions, as well as the fact that others are affected by software piracy, but they pay little attention to this action and they practically do not care. They consider software copyright laws to be inapplicable and unrealistic. However they fail to argue against intellectual property rights for digital products, such as software.

Based on Rahim et. al (1999) studies, nearly two-thirds of Brunei students admitted to having used pirated software. Entertainment was the prominent reason for using pirated software. Gender, computer experience and ownership of a personal computer, were found to affect students' use of pirated software. The students supported the introduction of copyright laws, however they still committed software piracy.

Teston (2008) study revealed a difference in moral orientation toward traditional, tangible property compared to intangible, computer-based property among early adolescents, but that this difference does not result from different moral reasoning levels between the pro-piracy and antipiracy students. Instead, the majority of students, 58.7% of the full sample and 62.7% of the pro-piracy students, had erroneous concepts of innovator's rights beyond the point of sale. This suggests curricular failure to address social convention, misconceptions of software ownership, and copyright laws.

## 3.5 Guidelines to encounter software piracy

According to Haines & Leonard ( 2007), there are four components model of ethical decision making. The ethical decision making is seen as sequential process. The four components are recognition of a moral issue, decision maker make a moral judgement, decision maker choose a course of action to establish moral intent and the person will engage in moral behaviour

based on the moral intent. The decision maker recognise a moral issues based on a decision maker engages in an ethical decision-making process rather than making a decision based on emotional or other grounds.

According to Kini, et al.(2004), as students are more influenced by other students in their development of moral intensity regarding software piracy, it is important to emphasize learning ethical principles and practices from other students and this can be accomplished by designing exercises that involves communities of students that learn from each other. Students also are more influenced by other university employees, they come in contact with, in their development of moral intensity regarding software piracy. Hence it is important to emphasize learning ethics principles and practices from other university employees and this can be accomplished by designing these involvements (for example, in computer lab settings) that involves learning from these communities.

Additionally, an increasing number of countries have tried to impose Internet filtering, a technical approach to controlling access to content. Generally, three techniques are commonly used to block access to websites: IP blocking, DNS filtering, and URL blocking using a proxy. Keyword blocking, which blocks access to websites based on the words found in requested URLs, or blocks searches based on a list of blacklisted terms, is a more advanced technique that a growing number of countries are employing. These methods can be implemented at different locations; for example, at the ISP, by an institution or at the specific Internet-connected device.

Many different filtering techniques exist, all aiming to restrict access to certain websites. Some are based on a "bad site" list that ISP's or authorities create and deploy at the network level, but parents, guardians, educators, or other authorities also have access to programs and tools able to monitor, track and block access to specific online activities on devices used by children; for example:
• Proxies and software that can allow or block specific sites and protocols (including anti-virus protection, email spam filters, pop-up blockers, anti-spyware, cookie deletion software, etc.)
• Content filtering software that finds and blocks specific content or websites
• Configuration options to set site privacy and monitoring features (e.g., Google SafeSearch filter, Privolock)

However, filtering can never be 100% effective. Filtering technologies are prone to two simple inherent flaws: under-blocking and over-blocking, Under-blocking refers to the failure of filtering to block access to all the targeted content. On the other hand, filtering technologies often block content they do not intend to block, which is known as over-blocking. Both these

failings occur because many blacklists are generated through a combination of manually designated websites and automated searches, and therefore often contain websites that have been incorrectly classified. Additional issues arise where other content is hosted from the same IP address or domain. Furthermore, filtering methods do not remove the illegal content from the Internet, and are prone to circumvention. They also have the potential to restrict free and open communications inadvertently or deliberately, and thereby to limit the rights of individuals or minority groups. Because network filters are often proprietary and/or use secret "black lists", there is often no transparency in terms of the labelling and restricting of sites.

This lack of transparency is particularly troubling when the corporations that produce content filtering technology work alongside undemocratic regimes in order to set-up nationwide content filtering schemes. Most states that implement content filtering and blocking augment commercially generated block lists with customized lists that focus on topics and organizations that are nation or language specific.

Children and young people are increasingly accessing the Internet via other Internet enabled devices; e.g., smart phones, tablets and gaming devices. This means that, even if filtering is deployed on the home or school computer, children and young people likely will still be able to access the unfiltered Internet through other means or perhaps even by circumventing the filters deployed on the computer. It is, therefore, important to help educate children about how to behave online and to engage them in discussing the problems they may encounter.

While software may be able to block specific high profile websites, there is no solution yet available that is robust over time or completely effective. Technologies are not able to accurately identify and target specific categories of content found on the billions of websites and other Internet applications such as news groups, email lists, chat rooms, instant messaging and social media. Filtering is never a substitute for good parental involvement and advice. In any case, these methods do not remove the objectionable or illegal content from the Internet; they only make it harder to access supervision.

It can be argued that filtering at the network level, such as DNS filtering, also causes network instability, encourages fragmentation, and erodes the foundation of the Internet.Other approaches to controlling content such as domain name seizure, intended not only to protect young people, suffer from most of the same problems as DNS filtering, including easy circumvention, failure to solve the underlying problem, and encouragement of a shadow network out of reach of law enforcement.

While software may be able to block specific high profile websites, there is no solution yet available that is robust over time or completely effective. Technologies are not able to accurately identify and target specific categories of content found on the billions of websites and other Internet applications such as news groups, email lists, chat rooms, instant messaging and social media. Filtering is never a substitute for good parental involvement and advice. In any case, these methods do not remove the objectionable or illegal content from the Internet; they only make it harder to access.

Finally, the Internet Society is concerned that child online protection can be a gateway or a back door to further government controls online. This said, children and young people cannot be made 100% safe online by blocking of content. However, we can improve the safety of children and young people online by empowering children, parents, guardians educators and peers to identify and deal with harmful content on computers, the Internet and mobile phones, and how to use technology both safely and responsibly, and by making available easy to use adjustable tools to manage access and content.

In 2011, the OECD released a report entitled The Protection of Children Online: Risks Faced by Children Online and Policies to Protect Them, and in 2012, the OECD adopted a Council Recommendation on the Protection of Children Online establishing three key principles:
•empowerment
•proportionality and fundamental values
•flexibility.

The detail recommendations are as follows:
* leadership and commitment through their policies;
• support a co-ordinated response by all stakeholders; foster consistency and coherence of
domestic child online protection initiatives across public and private stakeholders;
foster awareness-raising and education as essential tools for empowering parents and children;
• support evidence-based policies for the protection of children online; • encourage the development and adoption of technologies for the protection of children online that respect the rights of children and the freedom of other Internet users;
• strengthen international networks of national organisations dedicated to the protection of children online;
• share information about national policy approaches to protect children online and in particular develop the empirical foundations for quantitative and qualitative international comparative policy analysis;
• support regional and international capacity building efforts to improve policy and operational measures to protect children on the Internet;
• better co-ordinate work by the various international and regional organisations and bodies which play a role

to support government efforts in this area, and involve non-governmental stakeholders where appropriate.

## 4    METHODOLOGY

The research framework adopts mixed method approach that includes survey, in-depth interview and document analysis. The methodology used as depicted in figure 1 below:
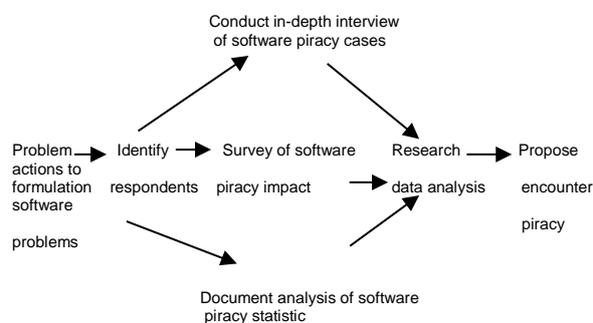


Figure 1: Methodology.

## 5    RESULTS AND DISCUSSIONS

Based on the summary shown in Appendix 1, 331 persons with 40 items has successfully analysed using Rasch Measurement Model that used Bond & Fox tools. This analysis have been getting 13104 data points from the probabilities calculation obtain from the persons and items evaluated.

It shows the cronbach alpha contribute 0.80 which relate with the raw score to measure correlation that obtain 0.94 logit. The person reliability is 0.76 logit whilst the separation is divided into 3 (1.79 logit). The item reliability is 0.97 logit and the item can be divided into 7 strata/group (6.22 logit).

The Wright Map in Appendix 2 shows that the items have been distributed accordingly to the measurement that correlated with each other and the persons (respondents). Each person in that Figure 2 represented 5 persons by using #. The items (questionnaires) have been table up to Software acquisition, software industry, social consensus, social norms, Intellectual Property (IP) consensus, IP Law Punishment and Pirated Software.

The maximum and minimum measurement for persons and items are 1.15logit, -1.10logit and 0.84logit, -1.29logit.

In Appendix 3, the propose guideline has been developed to guide the Malaysian students in having a good ethical value in software piracy. The students must gain an experience and time accordingly in understanding the importance to avoid software piracy. Producer and distributor becomes an important contributor in making sure the software piracy can be

eliminating from the software industry in Malaysia. Only a legal producer and distributor should be existed.

Objectives of the research are met by using random sampling. To meet the second objectives, questionnaires and interview done involve the aspect of moral and ethics whereas the last objective is met by obtaining the response on requirements for the guidelines.

Based on the Wright Map, all participants agreed that the Internet is the cause of software piracy because of it can be downloaded easily compared to purchasing it from a bookstore. Purchasing a software also involve cost that it becomes non preferable choice for the respondents.

Other factors agreed by all respondents that contributing to software piracy are as follows:
a) Software obtained from family or friends.
b) Original software is very expensive.
c) Most people use pirated software.
d) It is easier to copy from others or download pirated software from internet than to purchase original software.
e) Sharing software with others is doing other people a favour.
f) Software piracy helps the spread of software in industry.
g) Software industry is overcharging the consumers on the original software.
h) Acquiring software from purchased software that is installed in a computer.

All of the respondents agreed the factors that should be guidelines to encounter software piracy among IHL students are as follows:
a) IP law should allow the behavior of downloading and uploading pirated software from internet.
b) IP law should allow the behavior of making copies of software on CDs and redistributing to friends.
c) IP law should allow the behavior of purchasing one software license and installing on multiple machines.
d) You will achieve a sense of belonging by using the same software that others do.
e) You will use pirated software if many others are doing so.
f) Software distributor is to be blamed for the consumer's piracy behavior.
g) Software producer is to be blamed for the consumer's piracy behavior.
h) There is no functionality or user experience difference between original and pirated software.
i) A time-based pricing scheme for owning the software for a short while will be preferred.
j) IP law is enforced at a consumer level.
k) IP law is for the benefit of consumer.
l) IP law is for the benefit of software vendors.

m) If you pirate software, most of the people who are important to you would be against your piracy behavior.
n) What others are buying and using for computer software will influence your purchasing software.
o) The awareness of the laws governing installation of software on computers in a lab environment.
p) Using pirated software is harmful or harmless.
q) If you pirate software, most people who are important to you would look down on you.
r) Installed software on more than one machine when you have purchased a single copy.
s) Awareness of the laws governing installation of software on computers in a business environment.
t) IP law punishment if committed software piracy.
u) The severity of IP law punishment of pirating software.
v) Software provided by instructor for a class.
w) The acceptability of using software piracy.
x) The useful or useless software piracy usage.
y) Using pirated software good or bad.

Based on the Wright Map, the following factors contribute to software piracy impact on moral, ethics and ICT resources because of not all respondents agreed to them:
a) Trying to copy software from a computer lab or business environment.
b) Software purchased via mail order, catalog, telephone order or other source.
c) Software that comes with textbook.
d) Software purchased from off-campus store.
e) Software purchased from college bookstore.

Based on the Figure in Appendix 3, the propose guideline has been developed to guide the Malaysian students in having a good ethical value in software piracy. The students must gain an experience and time accordingly in understanding the importance to avoid software piracy. Producer and distributor becomes an important contributor in making sure the software piracy can be eliminating from the software industry in Malaysia. Only a legal producer and distributor should be existed.

The guidelines proposed based on these can be divided into two phases. The first phase should be implemented and then only the second phase can be implemented.

The first phases of the guidelines are as follows:
a) IP law should allow the behavior of downloading and uploading pirated software from internet.
b) IP law should allow the behavior of making copies of software on CDs and redistributing to friends.

c) IP law should allow the behavior of purchasing one software license and installing on multiple machines.
d) Achieve a sense of belonging by using the same software that others do.
e) Usage of pirated software if many others are doing so.
f) Software distributor is to be blamed for the consumer's piracy behavior.
g) Software producer is to be blamed for the consumer's piracy behavior.
h) There is no functionality or user experience difference between original and pirated software.
i) A time-based pricing scheme for owning the software for a short while will be preferred.
j) IP law is enforced at a consumer level.
k) IP law is for the benefit of consumer.
l) IP law is for the benefit of software vendors.
m) Psychological effect on committing pirating software that most of the people who are important to you would be against your piracy behavior.
n) The influence of other people who are buying and using computer software in purchasing software.

The second phases involve the following factors:
a) The awareness of the laws governing installation of software on computers in a lab environment.
b) Using pirated software is harmful or harmless.
c) Perception of people to those who committed software piracy.
d) Installed software on more than one machine when you have purchased a single copy.
e) Awareness of the laws governing installation of software on computers in a business environment.
f) IP law punishment if committed software piracy.
g) The severity of IP law punishment of pirating software.
h) Software provided by instructor for a class.
i) The acceptability of using software piracy.
j) The useful or useless software piracy usage.
k) Using pirated software good or bad.

On the other hand, interview has been conducted with four experienced respondents from CICT and FSCIT through phone interview. Purposive sampling are chosen based on their more than five years experiences in UNISEL. Content analysis method had been chosen to analyse the interview answers. Based on the interview conducted, all respondents admit that they have knowledge about software piracy. All respondents acknowledge that UNISEL student is practicing software piracy. This can be detected through student laptop and assignment. Most of respondents agree that software piracy will have an impact on student morale and ethics. The software piracy will also have an impact to student attitude and they will prolong this attitude after finish studies. Besides that, all respondents agree that software piracy will also have an impact to IHLs ICT resources. One of the examples of software piracy impact to IHLs ICT resources are UNISEL can be charged by authority because UNISEL lab facilities themselves are using illegal software due to UNISEL budget constraint and high renewal licensed fee. The following are suggestions given by the respondents to encounter software piracy:
a) Install firewall to block certain website.
b) Organize software piracy awareness seminar.
c) IHLs has to bear the cost to buy original software.
d) Student should be given free license to download original software that university bought.

These suggestions are tally with the findings in the questionnaire distributed to the respondents which show in the guidelines proposed.

## 6    CONCLUSION

This guideline is hoped to help reducing the cases of software piracy among students thus benefits the universities and the software companies. The finding shows that the cause of software piracy is from the easy access to download software from internet. It also shows the difference understanding of morality and ethical of students in software piracy. The guidelines to encounter software piracy among IHL students are divided into two phases. The first phase should be done and completed before the second phase can be implemented. The future research can be done on the framework to implement the guidelines.

## APPENDIX

Appendix 1: Summary Statistic Result from Rasch Measurement Model.
Appendix 2: Wright Map
Appendix 3: Guideline to Encounter Software Piracy.
Appendix 4: Questionnaires References.

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