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## Economy and technology as influential factors for digital piracy sustainability: An Indonesian case

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### Abstract

This research aims to figure out whether or not economy and technology are the reasons why digital piracy keeps going on. For this research, we use research conducted by Battacharje (2003) as the main reference. In this research, we examine economic and technological factors within 12 indicators, resulting that in average, most respondents agree that the reason why they keep doing digital piracy is its influence by economic and technology factors.

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*Keywords:* Digital piracy sustainability; economic factor; technology

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### 1. Introduction

In 2008, the rate of software piracy in Indonesia 1 percent from the previous year into 85% with the total potential amount loss about US \$ 544 million or US\$ 70-80 million in average per year ([www.republika.co.id](http://www.republika.co.id): 2009, [www.haki.lipi.go.id](http://www.haki.lipi.go.id): 2005), Besides Indonesia, digital piracy also happened in around Asia, USA and Sweden (Chiou et al.: 2005; Grose: 2006 in Balestino: 2007, Deejan: 2008). Gopal et al. (2002) defined digital piracy as a duplication digital goods, documents, audios, videos illegally, without asking legal permission from the copyright holder for any reason beside back up purposes. This activity not only happened in software industry. In 2001, 40% product sold in music industry is pirated product which reduces almost 7% of total sales in money and

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8% in unit (Chiou et al: 2005). This digital piracy activity grows faster as the development of computer and internet technology. It affects not only the piracy variance but also the quality of duplication product. After the computer and internet development, the quality of duplication product reduces less and reach to zero defect than the original one (Chiou et al., 2005).

Deejan (2008) divides the digital piracy patterns into two parts; hard goods piracy and file sharing. Hard goods piracy refers to the illegal act of reproduction of physical products such as music CD, video, DVD or software while file sharing is piracy of cultural goods in digital format on the internet using a gain-sharing communities. There are many factors which usually triggering piracy activities. The main factor of economic problems especially about price and income (Shapiro and Varian, 1999, Battacharjee et al., 2003), rate of economic growth and foreign investment (Husted, 2000) and the development of technology (Deejan, 2008). In some studies, piracy activities also could not be separated from social factors such as ethical factors, gender, or culture and habits. (Gopal & Sanders, 1997), individual and personal factors influence (Solomon & O'Brien, 1990)

This paper try to give a broaden point of view how digital piracy now growing especially in Indonesia. In another side, people need to know what factor influencing this digital piracy activity most in order to avoid this case became worse. To help reader get the whole idea, we organize this paper into six sections; introduction, theoretical framework, research methodology, analysis, limitation and suggestion

## **2. Theoretical framework**

### *2.1 Digital piracy*

Digital piracy defined by Software Publishers Association (SPA) (1997b) in Gopal et al. (2002) as an duplication digital goods, documents, audios, videos illegally, without asking legal permission from the copyright holder for any reason beside back up purposes. Meanwhile, according to Law and Wong (2005), piracy definition usually refers to the reproduction of software without permission. As for Hinduja and Andres (2001; 2006), piracy activity also including cd burning without a permit, file sharing between friends or between networks.

### *2.2 Hard goods piracy*

According to Deejan (2008), hard goods piracy refers to the illegal activity physical goods reproduction such as music CDs, video DVDs or software piracies which directly related to society socioeconomic characteristics and directly compete with the cultural industry by making production processes and distribution processes by itself.

### *2.3 File sharing piracy*

File sharing is piracy is a kind of piracy of cultural goods in the digital format through Internet by using sharing communities. In some studies the term piracy file sharing is also known as peer to peer piracy. This piracy patterns sometimes not recognized as a form of piracy because most individual documents and files that placed in internet becoming public property (Deejan, 2008).

### *2.4 Expected utility theory*

Expected Utility Theory proposes that in making a high risk decision, a person will choose to perform actions which can maximizing utility expected. This decision will consider about the results of each alternative and calculate the costs and benefits and probability of each alternative (Peace et al., 2003).

### *2.5 Technology acceptance model (TAM)*

Technology Acceptance Model (TAM) explained about what variables affecting people on accepting technology. Perceived usefulness in TAM is defined as personal believes that technology will improve his/her

performance while perceived ease of use is defined about personal level of confidence that technology will let they work effortless (Davis et al, 1989).

## 2.6 Hypothesis development

Basically, a profit and loss consideration affects decision to buy or select an item. The equal relationship occurs when individuals feel that they received equal benefit from this trading relationship (Glass and Wood, 1996). In digital piracy, price composition, income and the value of a product through the eyes of consumers deemed to affect consumers economically to continue doing digital piracy. Research conducted by Battacharjee (2003) found that CD prices have a strong influence on the increasing piracy of music online as also found that income has a negative effect for unpopular song. Therefore, the hypothesis built:

*H1: Economic factors is one of some factors that affecting digital piracy sustainability*

Perceived ease of use in TAM is defined as the level of how a person believed that by using technology they will need less effort (Davis et al, 1989). This model also became a reason why the technology cannot be separated from digital piracy. The development of media technology to high speed internet connection help people does piracy easily. Nowadays, only need one click to move a lot of files without permission. Easiness provided by the Internet connection became a reason to support digital piracy in the form of file-sharing piracy as found by the Peace et al. (2003). Battacharjee (2003) also supports the above statement that to purchase digital products, user also influenced by the internet bandwidth availability.

The development of internet technology has also creating new community in the virtual world, which popular as online community. Gu et al. (2007) defined online communities as a group of people who may have or have not meet each other but sharing mutual words and ideas through computers and communication media network. Therefore, the second hypothesis built:

*H2: Technology factor is one of some factors that affecting digital piracy sustainability*

## 3. Research methodology

### 3.1 Data source, population and sample

This study use random samples from the two population groups contain with 150 bachelor and postgraduate students in Faculty of Economics and Business, University of Gadjah Mada which familiar with Internet in their daily activities. This distinction is made with the assumption that each group has different characteristics. Bachelor students, representing young generation, usually became trend follower and became potential group of music and film lovers. According to Berman (2002) in Chiou et al. (2005) this group has great potency to do music piracy because of limited budgets and high knowledge of computers reason. This group usually has a good idol singer or band, and became the primary target market for the related industry. While postgraduate students represent a group of mature age and mostly own income so that may have a different perception about digital piracy. For data collection, researcher has directly distributed questionnaires to the respondents who expected the campus location Faculty of Economic and Business in the University of Gadjah Mada.

### 3.2 Identification variables and measurements.

#### 3.2.1 Economic variable

Economic variable measured by three indicators; 1. income respondents, 2. the price of the product and 3. the value of a product for respondents. Income of respondents in this case the defined as the amount of income received by the respondents each month or amount provided by parents monthly for the unemployment one. Income has been used as indicators in the various studies on digital piracy and in this study used indicators based

on research conducted by Battacharjee (2003). While price is defined as the price attached to a digital product, and value of a product stands for the way respondent looking at the contents contained in a product comparing with its price. Economic variables are measured by using perception questions with 5-point Likert scale.

### 3.2.3 Technology variable

Technology Variable has four indicators: 1. availability of the Internet network, 2. access speed, 3. online communities, 4. availability of file-sharing sites. The availability of Internet network access speed is taken from research conducted by the Peace et al. (2003) in Holsapple et al. (2008), which defined as respondent convenience in having internet access through either paid or free internet service. Access speed refers to amount of bandwidth they can use at any time using the Internet network. And the definition of online community and file-sharing sites defined as a community in the virtual world that normally join the mailing list, group, or group blog on social networking sites because of the same interest in a particular field. While file-sharing site is a web service that allows users to obtain various kinds of files that are already in the upload by other users. Files provided by this site are not copyrighted. Examples of file-sharing sites are: www.4shared.com, www.ziddu.com (Gu et al, 2007). This technology variable is measured by using perception questions using 5-point Likert scale.

### 3.3 Data analysis method

The data collected has been analysed by using descriptive statistic method to see the general overview about respondent's point of view about each variable as reason for keep doing digital piracy.

### 3.4 Sample characteristics

The characteristics of the respondents of this research can be seen in the following table:

Table 1: Respondent characteristics

Characteristics	Amount	Percentage
Age	< 20	55.40
	21-30	35.14
	> 30	9.46
Sex	Male	34.46
	Female	65.54
Education	Undergraduate	60.14
	Postgraduate	39.86

## 4. Analysis

### 4.1 First hypothesis; Economic variable on digital piracy sustainability

The first hypothesis test purposed is to see whether the economic factor is one of the factors that encourage digital piracy sustainability. Descriptive statistics test for economic variables are intended to determine whether respondents see the economic variable as one of variables that influence them to keep doing digital piracy. This test resulted that most respondent which categorized into three main groups; age, gender and education have choose price and income as main influence factor for them to keep doing digital piracy and see the value factor as a not to strong factor. This results support the research conducted by Bermand (2002), quoted by Chiou et al (2003), which found that most students in this research became the major groups who did music piracy because of limited funds

### 4.2 Second hypothesis; Technology on digital piracy sustainability

This descriptive statistic test aimed to determine whether the technology factor is one of the factors that encourage the occurrence of digital piracy. On average, respondents agreed that internet network availability,

internet access speed and file sharing site influence them to keep doing digital piracy and choose online community as a not to strong influence factor for them. This result supports research conducted by Peace et.al (2003) in Holsapple et al. (2008) which found that another reason of piracy development is the availability of Internet bandwidth. This result also support research conducted by Battacharjee (2003) found that the desire for users to buy digital products is also influenced by the availability of bandwidth and will be consistently lower for consumers with bandwidth higher.

## 5. Conclusion

Most respondent which categorized into three main groups; age, gender and education have choose price and income as main influence factor for them to keep doing digital piracy and see the value factor as a not to strong factor. This results support the research conducted by Bermand (2002), quoted by Chiou et al (2003), which found that most students in this research became the major groups who did music piracy because of limited funds

On average, respondents agreed that internet network availability, internet access speed and file sharing site influence them to keep doing digital piracy and choose online community as a not to strong influence factor for them. This result supports research conducted by Peace et.al (2003) in Holsapple et al. (2008) and Battacharjee (2003) which found that another reason of piracy development is the availability of Internet bandwidth.

## 6. Limitation and implications

This study has several limitations that cannot be avoided by the researcher

- This study uses a questionnaire developed by the authors that have not been tested in several studies. But the questionnaire used had been through the stages of testing required in scientific research
- This study uses only students as respondents, which may only represent part of digital piracy picture in Indonesia and made no comparisons with other occupational groups that could provide another accurate overview.
- This study conducted by using descriptive statistical tests only which provide only a general description of the study, not specific examine the influence, relationships or differences of each variable.
- This study did not focus on just one digital goods such as digital music, software, movies or games which might give general description among digital piracy only, not specific for one product only
- This study ignores the ethical and legal factors are usually closely related to digital piracy activities
- This study support some previous study conclude that economic and technology trigger people to keep doing digital piracy
- This economic and technology reasons can help people in digital industry to protect and avoid their goods from being pirated
- Future study can explore another segmentation of digital piracy. As this study uses the research sample group of students only, further research can include professional groups or other education groups as objects of research.
- This research uses various types of digital products so result general overview, further research can take one of the digital products have to be the object of study so that research results can provide a more specific description.
- This study ignores other factors which might very close to the digital piracy such as legal and ethical factors, further research could include these variables into the study.
- This study did not examine the specifics of the relationship or influence of one variable with another variable, allowing for further research to use different test equipment.

## References

- Al Rafee, Sulaiman & Timothy Paul Cronan (2006). Digital Piracy: Factors That Influence Attitude toward Behavior. *Journal of Business Ethic.* 63; 237-259.

- Balestrino, Alessandro (2007). It Is A Theft But Not A Crime. *CESIFO Working Paper No. 2047*.
- Bhattacharjee, S., Gopal, R. D., & Sanders, G. L. (2003). Digital Music and Online Sharing: Software Piracy 2.0? *Communication of ACM Journal*. Vol. 46, No. 7, pp. 107-111.
- Chiou, Jyh-Shen et al. (2005). The Antecedent of Music Piracy Attitudes and Intention, *Journal of Business Ethics*. Vol 57, No 2.
- Deejan, Sylvain (2009). What Can We Learn From Empirical Studies About Piracy? *CESifo Economic Studies* 55, 2, pp 326-352.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, pp.319-340.
- Glass, R. & W. Wood (1996). Situational Determinants of Software Piracy: An Equity Theory Perspective. *Journal of Business Ethics* 15, 1189-1198.
- Gopal, R. & L. Sanders (1997). Preventive and Deterrent Control for Software Piracy. *Journal of Management Information System* 13(4). 29-47.
- Gopal, Ram D., Sanders, G. L., Bhattacharjee, Sudip, Agrawal, Manish K., Wagner, & Suzanne C, (2004) A Behavioral Model of Digital Music Piracy. *Journal of Organizational Computing and Electronic Commerce*, Forthcoming. Available at SSRN: <http://ssrn.com/abstract=527344>
- Grose, T., (2006). Sing When You're Winning, Time, February 27, pp-40-42. In Balestrino, Alessandro. (2007). It is a Theft but not a Crime. *CESIFO Working Paper No. 2047*.
- Gu, Bin, Yun Huang, et al. (2007). Online Peer to Peer Communities: An Empirical Investigation of a Music Sharing Network as a Dynamic Two-sided Network. Working paper. [www.NETinst.org](http://www.NETinst.org).
- Gupta, Pola B., S. J. Gould, & B. Pola. (2004). To Pirate or Not to Pirate: A Comparative Study of the Ethical versus Other Influences in the Customer's Software Acquisition-Mode Decision. *Journal of Business Ethics*. Vol. 55 No. 3 pp. 255-271.
- Hartono, Jogiyanto, (2007). *Behavioral Information System*. Yogyakarta: Andi Publishing.
- Hartono, Jogiyanto. (2008). *Information System Methodology*. Andi Publishing. Jogjakarta.
- Holsapple, Clyde W. et al. (2008). Parameter for Software Piracy Research. *The Information Society*. 24; 99-218.
- Husted, B.W. (2000). The Impact of National Culture to Software Piracy. *Journal of Business Ethics*. 26. pp: 197-211.
- Peace, A. Graham. Dennis, F.Galletta, Thong, & James.Y.L. (2003). Software Piracy in the Workplace: A Model and Empirical Test, *Journal of Management Information Systems*, (20:1), pp. 153-177.
- Shapiro, Carl, & Varian, Hal R., (1999). *Information Rules: A Strategic Guide to the Network Economy*. Harvard Business School Press, Boston, Massachusetts.