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UNDERSTANDING MUSIC SHARING BEHAVIOR IN CHINA: DEVELOPMENT OF AN INSTRUMENT

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ABSTRACT

In this paper we propose a research model, set of constructs, and instrument for collecting data in China to investigate online behavior in the usage of file sharing technologies by music consumers. Recent studies associated with music download were focused, for the most part, on highly infrastructure-developed countries. Since technology maturity, market conditions, and economical situations in developing countries are different from those of developed countries; we developed a model for investigation online behavior in Chinese music consumers. As a pilot study to test the constructs in our model and its suitability for use in China, we surveyed 152 people the United States. We found the constructs robust for further investigation. The instrument was revised based upon the results of factor analysis and reliability testing and translated into Chinese. Data was further collected from 439 people in China. Results show that the constructs satisfy the reliability testing as well as preliminary regression analysis for the Chinese sample.

Keywords:
Chinese consumers, peer-to-peer, music sharing, music piracy, technology acceptance

PURPOSE OF THIS RESEARCH

In this paper we propose a research model, set of constructs, and instrument for collecting data in China in order to investigate online behavior in the usage of file sharing technologies by music consumers. In order to better understand the phenomenon of music downloading in China, we conceptualize music downloading constructs to discern Chinese consumers' habits with respect to music downloading, technology acceptance and behavioral intention to download music.

The need for the research of consumers in global music sharing networks is stated in the previous work by Amoroso and Guo (2006) and Amoroso and Koster (2003). Researchers surveyed the dependencies of music sales by age of consumer and type of music as reported by RIAA in 2005 and showed respondent demographics in the areas of retail buying, expected downloading patterns, and lost income to music record companies in the United States (IFPI, 2005). Given the radical changes of how the key players in the music industry are jockeying for position, this industry is a good field for studying the different orientations of users toward the consumption of digitized media through digital platforms. Although previous studies were conducted only within developed countries, we are testing the applicability of the TAM framework for the developing technological society of China.

We would like to clarify the terminology that we used. We differentiate downloading from file sharing. D*ownloading* is defined as copying digital files from a server, network or other media to a local file repository. We define *file sharing* as the movement of digital files from and to file repositories, where centralized "servers" may or may not be present. This research focuses on the music file sharing among computers.

A research model was conceptualized. In order to study music downloading in China, a survey instrument was created; measures for the constructs involved acceptable reliability and the evidence of factorial validity. The model was pilot tested

among 152 university students prior to collecting final data from 439 Chinese students. We discuss the preliminary regression analysis of the data and future efforts.

BACKGROUND

The Growth of Music File Sharing

The recording industry seems to be one of the areas in which the new digital technologies are bringing about the most tangible changes in distribution processes. The recent downturn in CD sales and the rapid diffusion of file sharing are creating the scenario where companies in the music industry have to change their approach to music downloading.

How big is the music downloading industry? Low cost and global availability of digitalized copies of artists' intellectual property make file sharing or peer-to-peer (P2P) networks very appealing. According to Liang et al. (2005), on a typical day, KaZaA – one of the most popular files sharing application – has more than three million users logged in and sharing 5,000 terabytes of content. Forrester research estimated $700 million loss in CD sales for the music industry in 2003 due to sharing copyrighted songs via file sharing applications (Amoroso, 2003).

What has been the impact of file sharing on music sales? An interesting study by Oberholzer and Strumpf (2004) showed that music file sharing has no statistically significant effect on purchases of CDs in their sample. File sharing may have, however, encouraged competition and therefore lowered prices for each item of recorded music. This, in turn, has allowed an apparently large pool of individuals to enjoy music.

Will the technology infrastructure of specific countries impact file sharing of music? It is commonly believed that countries with poor socio-economic situations will more highly engage in piracy of digital media due to poor enforcement of copyright laws. In January 2005, The Recording Industry Association of America (RIAA) submitted a report to the federal government which outlines piracy problems in more than 60 countries and is expected to guard "America's present and future global competitiveness." USTR (United States Trade Representative) identify China as a Priority Foreign Country for music downloading in the next decade (IFPI, 2005).

Affect of Music Downloading on Piracy

Piracy seems to be one of the greatest threats facing the music industry today (Chiou, Huang, and Lee 2005). Some studies have found that file sharing technologies – broadband Internet connectivity, digital compression, file quality, and peer-to-peer applications – have dramatically increased the online sharing of digitized products and therefore promoted the piracy of copyrighted music. The phenomenon of sharing music files online has been dramatically accelerated by various software packages, lower data storage costs, higher bandwidths, and the ability to send large collections of music via email. Inclination to pirate music increases dramatically as Internet bandwidth improves, with similar trends for all music categories (Bhattacharjee, et al. 2003). Even though some music down loaders experienced loses in sound quality due to compressed formats or experienced corrupt downloads, 90% of respondents continued to download music, indicating that the quality of downloading music alone is not a significant determining factor leading to a purchase. This finding has ramifications for the recording industry in that different economic models are unlikely to change consumer behavior with respect to music downloading. But is this the case in China?

Size of Music Downloading in China

China is the world's second-largest Internet market after the United States and in terms of music sales China is the 20th ranked music market in the world and the fifth in Asia (COMTEX, 2006). The Chinese digital music market reached $324 million in 2005, a 64% jump compared to previous year, and it was estimated that it would be as high as $528 million by the beginning of 2007 (MP3.com, 2006). China boasts that 87% of its population is made up of broadband users watching or downloading music videos (www.earthtimes.com, 2003).

Growth of Chinese Music Downloading

Chinese music downloading is continuing to grow and we are beginning to see a growth of investment in the Chinese music market. Most sources have stated seeing an annual growth rate of over 60% in China since 2004. The price of some music downloaded legally is considerably low. For example, a legal Chinese service top100.cn charges just one yuan per song (allofmp3.com, 2006). Top100.cn has entered into licensing agreements with major music labels such as EMI, SonyBMG, Santuary Record Group, China Record Corporation, and many others. In addition to this, Google and News Corp. have planned investments in Chinese companies (The Toronto Star 2006, MP3.com, 2006) while China Unicom and Warner Music signed an agreement for selling music to mobile phone users in China.

Dealing with Chinese Copyright Issues

Statistics from IFPI shows that 90% of CDs in China are plagiarized (ChinaTechNews, 2006). Illegal sales of music in China are valued by the International Federation of the Phonographic Industry (IFPI) at about $400m (£216m). Currently, Chinese laws do not apply to digital media but are limited to physical media only. Chinese music sharing services not only supply cheaper alternatives for music downloading but provide music in various formats, ranging from WAV-rips (highest quality), to MP3 (typical P2P quality) and even in formats like OGG, which is considered a high-quality compression, much better than MP3 (ChinaTechNews, 2006).

Increase in Chinese Government Regulation

In general, the Internet is regulated to a much greater extent in China than here in the United States. China's Ministry of Culture have released a new measure called "Several Opinions on Network Music Development and Management of the Ministry of Culture" which states that it must approve all music downloading companies before they run imported music online(ChinaTechNews, 2006). In China, the government blocks Internet content making companies such as Google China to release "China friendly" versions of its search engines (www.searchenginejournal.com, 2006).

RESEARCH MODEL

Because of the size of the music download market in China, the growth of the Chinese music download consumer, the copyright issues facing Chinese consumers, and government regulation for online music distribution in China, a study of Chinese music downloading consumers is important. Peer-to-peer technology, a popular and quickly adopted technology in the downloading of music and other entertainments, represents a primary method for the distribution of digital products in China. Yet, its technological and social characteristics and users' attitude and actual usage remain understudied; we investigate these issues in this paper.

In this paper, we present a research model and an instrument for studying consumer behavior of music down loaders in China. The model examines the propensity of music consumers to adopt file sharing technologies in a rapidly developing country - China. According to our review of the literature, music downloading was not tested in China using technology acceptance models, neither were aptitudes for music sharing software.

The technology acceptance model has been demonstrated to be a plausible model explaining individual adoption and usage of information technologies. Based on our investigation of the theoretical underpinnings, we suggest an extended model that includes antecedents and outcome measures that many TAM studies in this domain did not include.

Based upon the empirical research of music downloading constructs, the proposed model was adopted originally from the Amoroso and Guo study (2006). The model presented in Figure 1 extends the Amoroso and Guo model (2006) by including five added constructs: risk, trust, facilitating condition, enjoyment, and image. Each of the constructs is discussed below.

Perceived Ease of Use of File Sharing

Perceived ease of use of file sharing technology has been found to influence usefulness, attitude, intention, and actual use, in many studies. Perceived ease of use is the degree to which an individual believes that using a particular system would be free of physical and mental effort. Davis et al. (1989) and Venkatesh and Davis (2000) found that perceived ease of use directly and indirectly affects usage through its impact on perceived usefulness through the attitude toward using the Internet. *Perceived ease of use for file sharing* in our study measured the easiness of learning to download music on the Internet, easiness to obtain the desired music file, whether the processes for downloading music are clear and understandable, ease of file sharing, ease of becoming skillful at using music downloading programs, and overall ease of downloading technologies in general.

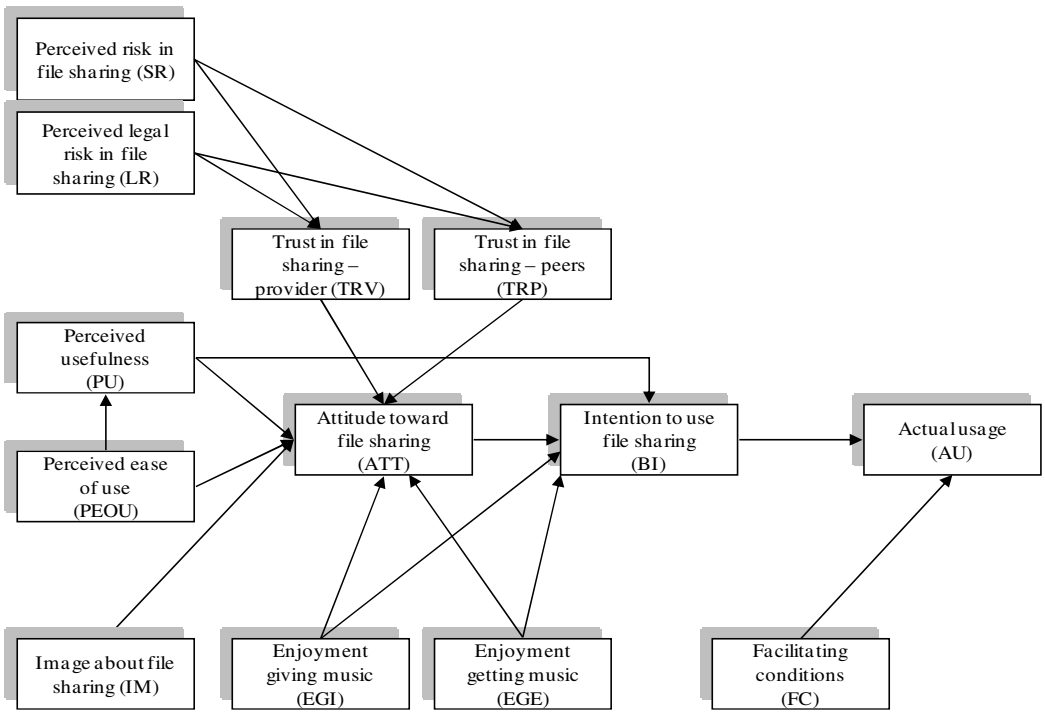

Figure 1. Exploratory Research Model

Perceived Usefulness of File Sharing

Perceived usefulness of file sharing is concerned with an individual's beliefs in the decision making process. Perceived usefulness is the degree to which an individual believes that using a particular system would enhance his or her performance. It has been found that the relationship between perceived usefulness and usage of the system is strong and consistent. Davis, et al. (1989) found that the relationship between perceived usefulness and usage was stronger and more consistent than other variables reported in prior studies. *Perceived usefulness of file sharing* for our study included measuring the ability to accomplish the downloading of music easier, improved the efficiency of downloading music, increased the likelihood of success in downloading music, and provided alternatives to purchasing music CD's at retail.

Attitude toward File Sharing

Attitude toward using is the user's evaluation of the desirability of his or her using the system (Madden and Rainie, 2005). The attitude toward using is an individual's positive or negative feelings about performing the target behavior. Davis et al. (1989) found that user's attitudes had a significant effect on behavioral intention. Taylor and Todd (1995) found that attitude is not a significant determinant of behavioral intention although the relationship between attitude and behavioral intention is more significant for experienced users. These findings show that users are likely to have a positive attitude if they believe that usage of a technology will increase their performance and productivity.

Intention to Use File Sharing

Behavioral intention to use files sharing is a measure of the strength of one's intention to perform a specified behavior. Venkatesh and Davis (2000) reported that behavioral intention is a good predictor of actual usage of a technology which has received numerous empirical supports from prior studies. One of the conclusions of the study by Davis et al. (1989) was that people's computer use can be predicted reasonably well from their intentions. *Intention to download music* in our study was measured as a combination of carrying out the downloading task and planned use of the downloaded music files (Agarwal and Karahana, 2000).

Actual Usage

Actual use is defined as the perceived amount of time spent interacting with a technology and the frequency of use. Actual usage, as originally conceptualized in the Davis, et al. (1989) study is measured by the frequency of use and the length of time of use. The *actual usage* construct was measured as a perceived level of use of file sharing downloading technologies,

knowing that there are conflicting opinions on the reliability of such self-reported measures (Straub, et al. 1995; Taylor and Todd, 1995).

Enjoyment of File Sharing

Enjoyment is an intrinsic motivation that is found to be an important driver of behavior. Enjoyment is defined as the perception of pleasure and satisfaction from performing particular behavior. In the context of music downloads, the link between enjoyment and download behavior is natural, as the utility of music per se is for enjoyment for most music consumers. The nature of the technology that we investigate, file sharing, opens another aspect of enjoyment – the enjoyment originated in altruism acts. In a study of the usage of knowledge repositories, researchers found that the pleasure associated with helping others has strong impact on users' contributing to knowledge repositories (Kankanhalli, et al., 2005). Similarly in the music file sharing context, we expect that being able to provide music that are needed by peers on the network will bring joy to the music provider. Hence, we tap into both sides of enjoyment, namely, the enjoyment from getting music and the enjoyment from giving music.

Image about File Sharing

Image represents the degree to which an individual believes that the adoption of an innovation will bring them prestige in their relevant community. This prestige influence affects an individual's belief structure through an identification mechanism (Venkatesh, et al. 2003). Image has been incorporated as an extrinsic motivation and a precursor to perceived usefulness (Venkatesh and Davis, 2000) and behavior intentions (Kankanhalli, et al. 2005). Although the extended TAM model (TAM2) does not model a direct link between image and behavior intention, significant relationship between image and intention was reported even after controlling for the effect of usefulness (Plouffe, Hulland, and Vandenbosch's 2001).

The adoptions of innovations are generally associated with positive images in prior innovation diffusion research. In the situation involving music piracy, music download behavior may be associated with both negative and positive images. It is important to know whether a positive or a negative social image is associated with the use of P2P applications in music download and how important it is in the formation of users' attitudes.

Trust in File Sharing

Trust is an important element in online exchanges especially those that are conducted under uncertainty and risk (Ba and Pavlou, 2002). Trust facilitates exchanges where uncertainties and dependencies are present and increases the willingness to take risks (Mayer, et al. 1995). The two main sources of uncertainties important in the file sharing context are based on the difficulty to adequately monitor the behavior of the *file sharing providers* on the one side and the *peers* (i.e., the users) in the file sharing network on the other side (Xu, et al. 2005). For example, file sharing applications may install malware or spyware which potentially give others a chance to access the user's personal information (i.e. hacking) or gain control over the user's computer system.

In the file sharing context we differentiate between trust in the *file sharing provider* and *file sharing peer network* and define *trust as a set of specific beliefs referring to the competence, integrity, benevolence, and predictability of a trustee*. Trust between the trustor and trustee is able to reduce the risk associated with an exchange (Jarvenpaa and Tractinsky, 2000; Xu, et al. 2005).

Perceived Risk in File Sharing

File sharing is typically associated with various risks and uncertainties. This risk can impede people to engage in file sharing behavior. In the literature, risk is defined as *the subjective belief of an individual to suffer a loss in pursuit of a desired outcome* (Pavlou, 2003). Important is that it is the user's perception or the belief that a loss is possible not the actual probability of a loss. We believe that two types of risks are important in the file sharing context: computer security risk and legal risk. Computer security risk can originate from both, the file sharing vendor and the peers on the file sharing network. For example, some file sharing applications may install harmful software such as malware or spyware on the user's computer system that give external parties access to the computer or may negatively affect the performance of other software (Xu, et al. 2005) or share harmful files carrying viruses or worms.

The perceived legal security risk is the legal liability for user actions in the file sharing context (Xu, et al. 2005). The user may face lawsuits and punishments when sharing music with other peers. Sharing copyrighted music files is illegal in most countries and the music industry pursues file sharing users by suing them (Chiou, et al. 2005). US and Germany, for example, have strict rules about sharing copyrighted music and actively pursues and punishes file share users. In contrast, file share users in China and China are still safe against punishments from the music industry.

Facilitating Conditions

Facilitating conditions are defined as the extent to which an individual believes that factors in the environment exist that makes a behavior easy to accomplish (Venketash, et al. 2003). In the context of file sharing, users need to have the access to a computer or similar device to download music as well as a stable and fast enough Internet connection. Especially in less developed countries, the insufficient telecommunications infrastructure and lack of adequate devices to download music can be a significant factor preventing music file sharing. Facilitating conditions are supposed to directly and positively influence actual behavior, i.e., the usage of file sharing technology (Venketash, et al. 2003).

METHOD AND ANALYSIS

Method

From the research model, we created an instrument based upon the scales found in the studies presented earlier. Our survey consisted of thirteen sections to measure the constructs in our model and to capture demographic data. We administered the survey online through an online tool, Survey Monkey. In order to develop and test the initial instrument for reliability and validity prior to collecting actual data from the Chinese sample, a pilot study was performed with US undergraduate students. US undergraduate students are a good sample for pilot study as they may have similar music downloading patterns as their Chinese counterparts.

Pilot data were collected via a survey of United States university students concerning their habits with respect to music downloading and their future music buying behavior. The survey was offered to 185 undergraduate students with over 168 undergraduate students in the United States completing the online survey, for a response rate of 90.8%. The majority of students were eighteen- to twenty-two- year old business majors taking a standard academic workload in terms of classes. This sample is appropriate for our study since these students are representative of the desired population who download music online. After eliminating cases that had missing values, we ended up with 152 responses for analysis or 90.5% usable response rate.

To collect final data from students in China, the original survey was translated into Chinese. We administered the survey online to the Chinese sample via Survey Monkey as well. The survey was offered to 777 undergraduate students with over 439 undergraduate students in China completing the online survey, for a response rate of 56%. The majority of students were eighteen- to twenty-five year old students.

Reliability of Pilot Data

To assess the reliability of the questionnaire, Cronbach alpha coefficients for the various subscales were calculated. An alpha coefficient of .70 or greater for an existing instrument is considered an acceptable measure of reliability. In the current study, Table 1 shows that the Cronbach's alpha for all subscales met or exceeded the required lower limit with the exception of perceived computer security risk (0.689) and perceived legal risk of file sharing (0.639) which was slightly below .70. We subdivided the trust construct into trust in the file sharing provider and trust in file sharing peers for purposes of analyzing the reliability of the scales, both showing strong Cronbach alpha coefficients (0.902 and 0.899 respectively).

Construct	Description	No Items	Reliability	Reference
PU	Perceived Usefulness	8	0.922	Davis, 1989; Lee 2003
PEOU	Perceived Ease of Use	5	0.935	Davis, 1989
EGI	Enjoyment Giving Music	4	0.952	Kankanhalli et al., 2005
EGE	Enjoyment Getting Music	6	0.835	Gao 2006; Jarvenpaa et al. 2000
ATT	Attitude toward File Sharing	5	0.957	Fishbein and Ajzen 1975
FC	Facilitating Conditions	6	0.923	Lee 2003
IM	Image	4	0.937	Moore and Benbasat 1991
TRV	Trust in File Sharing - Provider	6	0.902	Xu 2005
TRP	Trust in File Sharing - Peer	4	0.899	Xu 2005
SR	Perceived Risk of File Sharing	5	0.689	Javenpaa et al. 2000; Xu 2005
LR	Perceived Legal Risk in File Sharing	5	0.639	Chiou 2005
BI	Intention to Use File Sharing	4	0.891	Venkatesh et al. 2003
AU	Actual Usage	3	0.726	Amoroso 2007

Table 1: Reliability Analysis Original Scale Pilot Data

Construct Validity of the Pilot Data

We used factor analysis as an assessment of construct validity. Moore and Benbasat (1991) state that, where possible, data analysis ought to be grounded in a strong a priori theory set. This research fits the approach where the constructs are based on a substantial body of prior research and where the scale development fits the construct's conceptual meaning as a method of ensuring construct validity. We conducted principal components analysis with varimax rotation yielding a seventeen-factor solution with eigenvalues greater than 1.0, explaining 79.2% of the variance in the data set.

We examined the rotated factor matrix for items that did not load strongly on any factor (<0.60), that loaded on another factor greater than the intended component, or that loaded relatively equally on more than one factor. These conditions would indicate a less than optimum validity of the item to measure what it was intended to measure and instead might indicate it was measuring something else. Most of the items for the constructs loaded cleanly on separate factors with a few exceptions. *Perceived usefulness* had strong loadings with the exception of PU8 (0.494) which indicated that using file sharing would give me an access to a wide variety of music options. *Actual Usage of music downloading* showed loadings above 0.691 with the exception of AU3 (0.389) which measured the percentage of music being downloaded.

The *enjoyment* construct was mixed in that enjoyment giving music loaded cleanly on one factor, while enjoyment getting music had two items that loaded lower than expected. Two items in the *facilitating conditions* construct loaded on a different factor: having "handy" file sharing software and time for downloading music were not part of the other four facilitating conditions items. Both of the *risk* constructs had loadings that went to other factors. In the construct dealing with perceived computer security risk, two of the items had both low loadings and had different factors that they loaded on (0.439, 0.353). The perceived legal risk sub-construct also had two items that loaded on another factor, which dealt with the ability of the respondent to understand the law and copyright infringement.

Revised Scales

We adjusted the scales by removing low loadings and/or loadings on different factors and ran both the reliability and validity tests .Table 2 reflects the Cronbach alpha reliability scores run on each of the constructs. As a result all constructs including the perceived computer risk and perceived legal risk have a Cronbach alpha coefficient above 0.70 and thus exceed the required alpha coefficient limit (see Table 2).

Construct	Description	No Items	Old Rel	New Rel	Improvement
PU	Perceived Usefulness	7	0.922	0.919	-0.003
EGE	Enjoyment Getting Music	6	0.835	0.820	-0.015
FC	Facilitating Conditions	4	0.872	0.930	0.058
SR	Perceived Computer Security Risk of File Sharing	3	0.689	0.915	0.226
LR	Perceived Legal Risk of File Sharing	3	0.639	0.746	0.107

Table 2. Reliability Analysis Revised Scales

Reliability of Chinese Data

As with the pilot data, data from the Chinese sample was analyzed for reliability by calculating Cronbach's alpha coefficients. As shown in Table 3 all the constructs have a reliability of over 0.7. Thus all constructs showed good reliability. The reliabilities are much higher than the pilot study.

Construct Analysis of the Chinese Data

Similar to the pilot study we conducted factor analysis as an assessment of construct validity on the Chinese data. We conducted principal components analysis with varimax rotation yielding a thirteen-factor solution with eigenvalues greater than 1.0, explaining 77.12% of the variance in the data set. Most of the items for the constructs loaded cleanly on separate factors with one exception. As with the pilot study, the *enjoyment* construct was mixed in that enjoyment giving music loaded cleanly on one factor, while enjoyment getting music had two items that loaded lower than expected. We removed two items from the Enjoyment construct (EGE7 and EGE8). Fun getting music and enjoyment listening to music were not as strong as other items in the scale.

Contruct	Description	No Items	Reliability
PU	Perceived Usefulness	7	0.962
PEOU	Perceived Ease of Use	5	0.941
EGI	Enjoyment Giving Music	4	0.932
EGE	Enjoyment Getting Music	8	0.886
ATT	Attitude toward File Sharing	5	0.957
FC	Facilitating Conditions	4	0.947
IM	Image	4	0.911
TRP	Trust in File Sharing - Provider	6	0.960
TRV	Trust in File Sharing-Peer	4	0.945
SR	Perceived Risk of File Sharing	3	0.864
LR	Perceived Legal Risk in File Sharing	3	0.832
BI	Intention to Use File Sharing	4	0.923
AU	Actual Usage	3	0.783

Table 3: Reliability Analysis Original Scale Chinese Data

We adjusted the scales by removing low loadings and/or loadings on different factors and ran both the reliability and validity tests. As a result all constructs including the enjoyment have a Cronbach's alpha coefficient above 0.70 and thus exceed the required alpha coefficient limit.

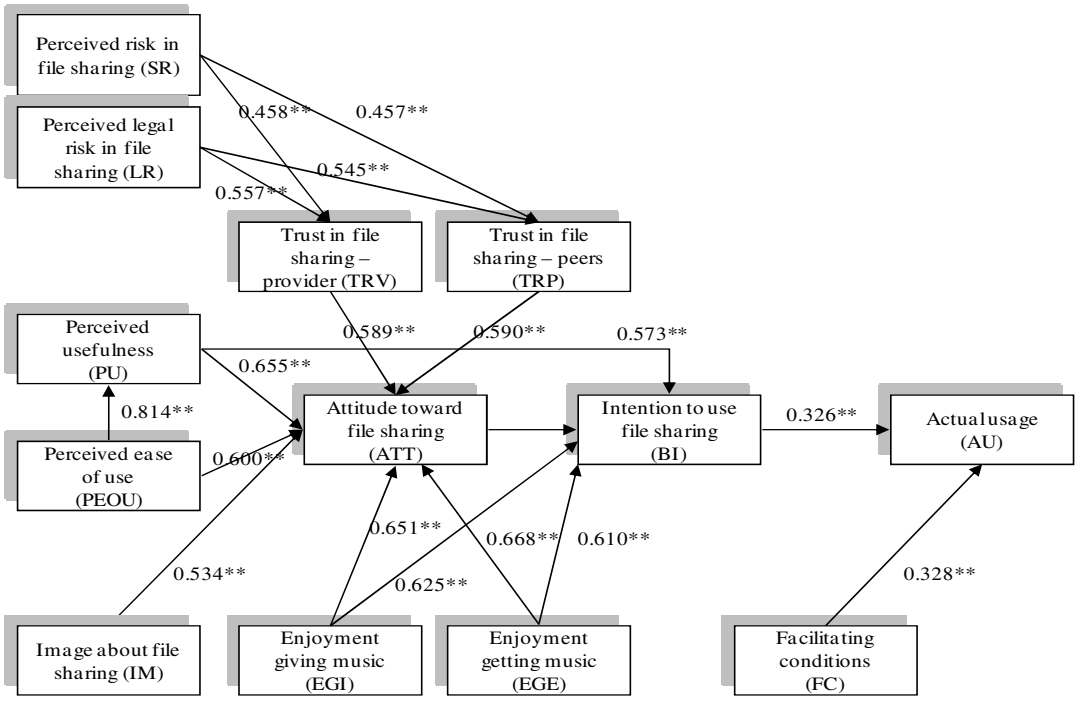

Figure 2: Regression Analysis Results for Chinese data.
(** Significant at 0.01 level)

Regression Analysis of Chinese Data

In order to perform a preliminary examination of the relationships in the model, regression analysis using Pearson's correlations coefficients were executed for the Chinese data. Figure 2 shows the correlation values for all relationships. As observed, all relationships showed good correlations except for BI→ AU (0.326) and FC→ AU (0.328) at the 0.01 level significance, supporting the structural model for investigation. Most of the relationships are strong showing relationship, greater than 0.600, between constructs. Notable are the relationships between enjoyment giving and getting music and attitude toward using (0.651, 0.625) and intention to use file sharing (0.668, 0.610) indicating that "enjoyment" is a crucial component of attitude toward using music downloading

technologies. All of the "perceived risk" and "trust" constructs showed strong relationships with both attitude and intention to use file sharing technologies. The results indicate that the data is good for further statistical investigation.

DISCUSSION AND CONCLUSION

The purpose of this paper was to build a research model and instrument for collecting data in China in order to understand the music downloading patterns with relation to technologies and adoption. In this research, we developed a research model and created an instrument that examines the patterns of music down loaders to address their needs and propensity to adopt Internet technologies. This research effort tried to understand the determining factors of music consumers utilizing file sharing technology. It related individual characteristics and user perceptions to the behavior of music downloading.

After developing a theoretical model for investigation, based primarily upon existing studies conducted in infrastructure-rich countries, we conducted a pilot study with 152 respondents in order to test the reliability and validity of the research constructs as well as to see if already established construct relationships will hold. We examined the constructs by conducting reliability and construct validity tests. The original scales had strong reliability with a one exception: *perceived legal risk*. We used factor analysis as a measure of construct validity and found that most of the items loaded properly on their own factor with a few exceptions. *Enjoyment getting music* and *perceived usefulness* had items that loaded lower desired. *Facilitating conditions, perceived computer and legal risk* had several items that loaded onto another factor. We adjusted the scales by removing low loadings and/or loadings on different factors yielding an improvement in the factor analysis.

After testing the constructs for reliability and construct validity with the pilot US data, we collected final data from 439 Chinese undergraduate students. We tested the Chinese data for reliability and construct validity. All constructs had strong reliability. Most constructs showed strong construct validity with the exception of the *Enjoyment* construct. We adjusted the scales by removing the items with low loading. As a result all constructs showed a strong improvement in factor analysis and improved reliability.

Regression Analysis using Pearson's coefficients was performed on the Chinese data to examine the relationships between the constructs. Most relationships were significant except for BI→ AU (0.326) and FC→ AU (0.328) at 0.01 level significance.

This next step in this research is to confirm the relationship between constructs as proposed and tested in other studies by performing Structural Equation Modeling . This will give us insight to relationship between the various constructs and implications of research model. This research will facilitate in determining Chinese consumers' habits with respect to music downloading, technology acceptance and behavioral intention to download music and hence the chances of success of commercial music downloading.

REFERENCES

1. Agarwal, R. and Karahanna, E. (2000) Time Flies when you're having fun: Cognitive absorption and Belifes about information technology usage, *MIS Quarterly,* 24, 4, 665-694.
2. Altinkemer, K. and Bandyopadhyay, S. (2000) Bundling and distribution of digitized music over the internet, *Journal of Organizational Computing and Electronic Commerce*, 10, 3, 209-224.
3. Amoroso, D., Guo, M.(2006), *Proceedings of the 39th Hawaii International Conference on System Sciences*, Hawaii.
4. Amoroso, D. and Koster .A. (2003) The impact of internet distribution and file sharing on the music industry, *European Applied Business Research Conference*, Venice, Italy.
5. Ba, S. and Pavlou, P. A. (2002) Evidence of the effect of trust building technology in electronic markets: Price premiums and buyer behavior, *MIS Quarterly,* 26, 3, 243-268.
6. Bhattacherjee, S., Gopal, R. and Sanders. G (2003) Digital music and online sharing: Software piracy 2.0? *Communications of the ACM*, 46, 7, 107-112.
7. Brancheau, J. C. and Wetherbe, J. C. (1990) The adoption of spreadsheet software: Testing innovation diffusion theory in the context of end-user computing, *Information Systems Research*, 1, 2, 115-143.
8. Chiou, J.-S., Huang, C.Y.., and Lee, H..(2005) The antecedents of music piracy attitudes and intentions, *Journal of Business Ethics,* 57, 2, 161-174.

9. Davis, F.D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13,3, 319-340.
10. Davis, F., Bagozzi, R., and Warshaw, P. (1989) User acceptance of computer technology: a comparison of two theoretical models, *Management Science*, 35, 982-1003.
11. Fishbein, M. and Ajzen, I. (1975) Belief, attitude, intention, and behavior: An introduction to theory and research, Addison-Wesley Pub. Co,, Ontario.
12. Gao, Y. and Koufaris, M. (2006) Perceptual antecedents of user attitude in electronic commerce, *The DATA BASE for Advances in Information Systems,* 37, 2, 3-42.
13. Jarvenpaa, S. L., Tractinsky, N., and Vitale, M. (2000) Consumer trust in an Internet store, *Information Technology and Management,* 1, 45-71.
14. Kankanhalli, A., Tan, B. C. Y., and Wei, K. K.(2000) Contributing knowledge to electronic knowledge repositories: An empirical investigation, *MIS Quarterly,* 29, 1, 113-143.
15. Koster, A. & Amoroso, D. L. (2003) Evolution of music distribution over the internet. *Proceedings of San Diego International Systems Conference.*
16. Mathieson, K. (1991) Predicting User Intentions: Comparing the Technology Acceptance Model with the theory of planned behavior, *Information Systems Research*, 2, 3, 173-191.
17. Mayer, R. C., Davis, J. H., and Schoorman, F. D. (1995) An integrative model of organizational trust, *Academy of Management Review,* 20, 3, 709-734.
18. Moore, G. and Benbasat, I. (1991) Development of an instrument to measure the perceptions of adopting new information technology innovation, *Information Systems Research,* 2, 3, 192-222.
19. Oberholzer, P. and Strumpf, K. (2004) P2P's impact on recorded music sales*, Second Workshop on Economics of Peer-to-Peer Systems,* Massachusetts.
20. Pavlou, P. A., (2003) Consumer acceptance of electronic commerce: Integrating trust and risk with the Technology Acceptance Model., *International Journal of Electronic Commerce,* 7, 3, 101-134.
21. Pavlou, P. A. and Gefen, D. (2004), Building effective online marketplaces with institution-based trust, *Information Systems Research,* 15, 1, 37–59.
22. Plouffe, C. R., Hulland, J. S., and Vandenbosch, M. (2001) Research report: Richness versus parsimony in modeling technology adoption decisions-understanding merchant adoption of a smart card-based payment system," *Information Systems Research,* 12, 2, 208-222.
23. Straub, D., Limayem, M., and Karahanna-Evaristo, E. (1995), Measuring system usage: Implications for IS theory testing, *Management Science*, 41, 8, 1328-1342.
24. Taylor, S. and Todd, P. A. (1995) Understanding information technology usage: A test of competing models, *Information Systems Research,* 6, 2, 144-176.
25. Venkatesh, V. and Davis, F. D. (2000) A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies, *Management Science,* 46, 2, 186-204.
26. Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2000) User acceptance of information technology: Toward a unified view, *MIS Quarterly,* 27, 3, 425-478.
27. Xia, L. and Sudharshan, D. (2000) An examination of the effects of cognitive interruptions on consumer online decision processes, *Second Marketing Science Internet Conference*, USC, Los Angeles, California.
28. Xu, H., Wang, H., and Teo, H.-H. (2005) Predicting the usage of P2P sharing software: The role of trust and perceived risk, *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*.

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