

Chinese Ethics in Communication, Collaboration, and Digitalization in the Digital Age

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This paper mainly focuses on the discussion of ethical issues in communication, collaboration, and digitalization among scholars from humanities, social sciences, natural science, engineering, and so on. The major force, digitalization initiated and supported by government, drives scholars to work together with high expectations beforehand. After a couple of years' collaboration, the beautiful dream becomes bitter to scholars for some ethical problems become so critical and annoying to them. It is obviously important to everyone that he will face it if he wants to manage his research data in digital form with helps from many other experts. Three typical examples with ethical issues will be depicted in anonymity for protection to those whom involved in collaboration and digitalization. We also will bring out a question of the term of 'ethics,' with Chinese definition, in a sense of the universal concern. With a brief but key introduction to Chinese ethics, we will point out the concepts of the major difference of ethics in western society and Chinese society is the definition of 'ethics.' Chinese ethics focuses on the relationship of 'people' instead of 'work' (or matter). Chinese people define 'ethics' as the relationship of people, which is according to the distance of people's relationship. Take it into concern on the thinking of "virtual reality and communication ethics," we believe some vital, inclusive, and prospective conclusions will be reached in this context, in a broad aspect.

Introduction

Since 1997, Digitalization of library collections, museum collections and archives has become a target force gathered people from academic community in many countries. With a support from the government(s) and institution(s), scholars, researchers and professors in humanities and in information science/technology start to work together on the digitalization of cultural collections and archives. This is a totally new 'job' to everyone, especially to those whom never walk out of their own ivory tower. And, the outcome of their cooperative work will be totally new to compare to the past one in the man's history. The world of knowledge is changing while the information is digitalized.

Ching-chun Hsieh, an information researcher, said in his lectures to scholars at Peking University, also to academic people in Taiwan, Japan and the United States many years ago¹, "the medium is changing, therefore, the way of collecting, storing, preserving and presenting data/papers/ideas is also revolutionary changing.... And, the knowledge after people collecting, storing, preserving and presenting, is going to be changing." To scholars in humanities, this change is going to be a long nightmare if they do not aware or not ready for the rapidly developing digital world². This is much more obvious in Chinese studies than other fields³.

Based on the National Digital Archives Program (NDAP) and the National Digital Museum Project, also with a study of "Communication, Collaboration, and Digitalization," this paper will focus on the ethical aspect in the communication, collaboration, and digitalization. It is interesting to see that people who are involved in those projects of digitalization are heavily influenced by their mother culture no matter what their academic training or backgrounds are.

For most Chinese scholars with western higher degrees in Taiwan, they do have some different attitudes from their fellows without western degrees toward communication, collaboration while doing digitalization of their work at the very early beginning. Nevertheless, gradually they coped with their fellows in Chinese way.

The major difference of ethics in western society and Chinese society is the definition of ‘ethics.’ Chinese people define ‘ethics’ as the relationship of people which is according to the distance of people’s relations, such as father and son, husband and wife, brothers and sisters, teachers and students, bosses and employees, and so on. The term of ethics focuses on the relationship of ‘people’ instead of ‘work’ (or matter). The concept of Chinese ethics is much confused by those who involved in collaboration with western scholars in digitalization. This paper is going to discuss it in detail.

The Definition of Ethics in Chinese

The term of ‘ethics’ in Chinese has two highly related but not exactly equivalent definitions, one is like ‘moral codes,’ the other is as ‘lun li’ with the meaning of ‘normal relationships among people,’ ‘comparison,’ ‘classification,’ and ‘order.’⁴ In fact, there is no exact equivalent one in Chinese with ‘ethics.’ However, ‘ethics’ is always translated as ‘lun li’ in Chinese with the context of ‘moral codes,’ then applied in all discussions by most scholars. We also would like to follow this way to discuss communication ethics in this paper.

The Concept of Chinese Ethics

Chinese ethics mainly was developed and elaborated by Confucius, the Chinese classic philosopher in early 5th century before Christ. Confucius cared much about ‘*jen*,’ which was

talked about most in his dialogues (*Lun Yu*). This Chinese character carries the meaning with “the relationship between an individual with others.” ‘*Jen*’ has the meaning of ‘benevolence,’ ‘humanity,’ ‘mercy,’ ‘charity,’ ‘magnanimity,’ and ‘kindness,’ also often including the meaning of ‘to be philanthropic,’ ‘love,’ ‘love and justice,’ and ‘benevolence and generous.’

In practice, ethics is not only including ‘the relationship between people and people,’ but also including ‘the relationship with heaven and divinity, with the nature.’ Chinese people are always told to respect *Five Superiors*, i.e., the heaven, the earth, the king, the parents, and the mentor/teacher, also to live with a belief in the *Five Ethics*, which are ‘between sovereign and subjects,’ ‘between parents and children,’ ‘between husband and wife,’ ‘among brothers and sisters,’ and ‘among friends’. In the context of Chinese ethics, *Five Superiors* and *Five Ethics* are the basic concepts, also as the guidance for people to live in society.

This can be found from *Chung Yung*, a classic book in Chinese philosophy, the *Five Ethics* are a guide for all the Chinese people, including emperors and intellectuals, in detail. Also in *Li Chi*, a classic Chinese book in ethics, mainly talked about the manners and rules between peoples, and human beings with all others in the world, including the relationship between human beings with the nature, God and ghost, and their ancestors. The book gave all the detailed guidelines with rationales about the ethics.

In ancient time, Chinese people paid much attention to ‘ethics’ in their lifetime because they believed that ethics is the corner stone to build up a society to function and making it in order. For instance, it is said, “there is no difference between human beings and animals if a

person without ethics.” The most extreme ethics in Chinese culture is ‘*hsiao*,’ a character having to do with filial piety or devotion to parents. Every Chinese is educated and cultivated to respect and needed to take care of his parents in his lifetime. He could be scorned as “a son without *hsiao*” all the time if he did not take good care of his parents while alive. In this case, the unethical person would be punished badly by his people not by law but by the social pressure, like the punishment of ex-communication in Europe in the Middle Age, or even worse than that. Nowadays, looking at the media in Taiwan and China, to a great extent, this saying is still true in many occasions in Chinese society. The ethical concern still goes to the first, then the legal aspects, in all cases, in all levels of educational background, and in all arenas. In other word, the ethics of ancient Chinese’s is still carried by the modern Chinese people.

In Chinese culture, ‘the relationship between people and people’ is the core of ethics. The relationship starts from the very beginning, an individual, who always obeys the social rules, requirements inherited from ancestors. The individual stands in the center; the first and closest circle around him is his family, then the second circle with his village or community, the third with his country, then the world, the nature, and the heaven. Therefore, the Chinese are always concerned very much about his parents, brothers, sisters, grand parents (both father side and mother side), uncles and aunts (both father side and mother side), and other relatives for these people are in the closest circle of ‘human relationships’ with the individual. This can be traced back in the language of Chinese, with no equivalent words or terms in English, for instance, nouns as *hsiung* (the elder brother), *di* (the younger brother), *chieh* (the elder sister), *mei* (the younger sister), *po* (father’s elder brother), *shu* (father’s younger brother), *chiu* (mother’s brother), *yi* (mother’s sister), *ku* (father’s sister), *sao* (wife of elder brother’s), and so on; verbs as

hsiao (filial piety or devotion), *t'i* (show brotherly, sisterly love), etc. All of these words show the relationship between people is vividly differentially defined, heavily depended on the distance and relative (in blood) of each other. We could not see the definition of ethics in this way in western discussion.

The Practice of Chinese Ethics

Confucius said, “to educate oneself well, to take good care of families, to manage the people in harmony, and then to conquer the world.” This is very popular, almost to everyone’s mind. From this saying, Chinese ethics starts from the ‘self,’ with the individual’s morality first, then goes to the relationship with others. Confucius also said, “You can help people unless you can help yourself first, and you will be able to get to people after you get to yourself.” This idea is also starting from the position of an individual, then to reach his family, his community, his country, and the world. In Confucius philosophy, it seems the ethics aims at the individual and his relationship with others, but also includes the practice of ethics into society.⁵ In other words, his ethics is not only as the individual’s guidance to live with his fellows but also for the society’s norm to run peacefully.

While talking about profits, Confucius recommends that ‘relational or affection,’ ‘rational,’ and ‘legal’ aspects to look at it. For instance, in the case of a father’s criminal behavior, Confucius asserted that the son should not go to the police to report his father stole a cow instead he should convince his father to return the stolen cow to the owner. Confucius said that the son should never turn in his father. Otherwise, the family will be into a miserable situation because of without bread supply if the father goes to jail. It is also with no help to the matter, if the damage of stealing a cow is made. The better way to handle it is to return the cow. Then,

everyone in the case will be happy, also saving the time and money to all. In this case, ‘relation and affection’ concern goes to the first priority, ‘ration’ as the second, then the last of ‘legal’ concern. This example is a typical case in discussion of the difference between Chinese ethics and Western ethics.

A modern Chinese anthropologist, Professor Fe, called the *Five Ethics* in Chinese culture is the ‘gradient relationships.’ (Fe, 1948, p.22). He pointed out the self-centered concern as the first priority in Chinese culture is the core of unethical value system toward organizations or groups. It is true that the first human relationship comes to the first concern if there is any conflict of interest happened. Therefore, groups or organization with no intimate relationships with the individual always go to the last or far behind the relatives. However, there are some examples in literatures although those were not explicitly addressed in the *Five Ethics*, demonstrating which relationships to be the first instead of the second by the book (*Five Ethics*). For example, while a soldier has to die for his country, his sacrifice is called as ‘Big Loyalty,’ and also can be called as ‘Big Hsiao,’ though he can not take good care of his parents any more.

Information Ethics

In human society, people are assumed as rational beings. In tradition society, men always interact with others in face-to-face communication. After the advent of mass media in modern society, the way of communication becomes multiple and plural, also much more complicated than the old time. However, the principles of ethics are much as the same, i.e., human dignity, social justice, reciprocity, free expressing, equal distribution, assertion of cultural difference, and so on. In practice, ethical issues are always in different forms with some controversial debates in different societies.

As previously discussed, there is a drastic change on going caused by the IT in information age. The globalization of communication, also with the overwhelming application of IT makes the whole world become 'small,' that means much closer relationship of different jobs, more dependence on each field and on every country. In this case, IT pushes people to think about the new dimension of ethics in an information age (Hsieh, 1992).

According to Mason (1986), 'privacy,' 'accuracy,' 'property,' and 'access' are the four information ethics. In other words, the digitalized content over the Internet raises questions of 'privacy,' 'accuracy,' 'property,' and 'access,' which is frequently discussed in communication ethics. Although it sounds the same, also applied into the Information Act/Law in many countries, there are still some unsolved problems in practice in current digitalization stage.

In the information age, 'Privacy' deals with the issue of free speech, free expressing in public sphere and the anonymity, also related to media's social responsibility. The 'accuracy' issue means 'information integrity,' that includes accuracy, precision, timing and appropriation (in form and quantity). Intellectual property right, ownership, control and information sharing are the main topics of 'property' issue. Fair use, equal distribution, equal access to everyone is the access issue of information.

Cyber World with Chinese Ethics

'Virtual' means "with the same function, the same utility," came from the same root of words as 'virtue.' 'Virtual reality' has the meaning of "the object or objects, or settings have the same function and utility as the real one has." Spoken and written languages are symbols to

represent of thoughts. In the sense of physical condition, what languages described is a virtual world of the reality. There are some sayings in Chinese; to watch out the reality is not the words, not the sentences, neither the exact case described as it. In this sense, theoretically, there is no need to differentiate 'reality' and 'virtual reality.' Nevertheless, in practice, reality and virtual reality still have some degrees of difference in real life.

The most salient difference is: the way of communication is changed with different settings and environments, controlled by pseudo-characters. The history of human communication taught us that oral communication and written communication are different from each other. And, communication in the cyber world must have different assumptions from the old one we used to. In cyber world, a real person can become 'virtual,' and vice versa. How people react in the cyber world is similar to acting in a play or a drama, or even like to communicate to the author or to the subjects while reading a novel. People did have different attitudes toward cyber space than toward their real life. In the cyber world, most people assume they could do anything as a pseudo-character without any responsibility if their language or behavior against the law or violating ethics in the real world. That's why many suspects in the cases of cyber crime confess they thought they did not break the law, with the virtual roles by pseudo names. The rationale sounds logical at the first glance. However, it is wrong no matter where he did in the cyber world or in reality as long as the deed itself that has already hurt someone or made some damages in real life. Free thought is allowed in all kinds of communication, but actions and behaviors need to pay the price with its' consequences. This is the philosophy of Chinese ethics.

From the Chinese ethical standpoint, to communicate with a real person in face or in written will be different from the way to communicate with a virtual character over the Internet. If the virtual character is a friend in real world, then the relationship with a friend is the baseline. Otherwise, the relationship with a stranger (the virtual character) or other objects will be a totally different concern. This principle is also appropriate for facing and dealing to those ‘matters’ or ‘incidents’ happened in real life and virtual world.

As previously discussion, Chinese ethics emphasizes on the social justice, fairness to everyone, with the harmony of human relationships in the society. In the case of cyber crime like hackers’ invasion to a database, this behavior has already caused some damage, such as peeking personal files of someone else without any consent, stealing information constrained to a certain restriction, etc., no matter whether they take anything from the database or not. In the real life, the hackers violate people’s privacy also break the rule of fair access with his privileged skill of technology, and caused a chaos making people feel uncomfortable, insecure, and worried. This did destroy the harmony and peace of a society. As the Chinese concern on people and society in reality, there is no doubt that the hackers’ behavior is unethical even in the cyber world.

Communication, Collaboration, and Digitalization

The greatest enterprise of the mind has always been and always will be the attempt linkage of the science and humanities. (Wilson, 1998, p.8)

Digitalization is a high technology, a resistant trend for academic community in everywhere now, also with an overwhelming power to push scholars, researchers and professors to face a changing environment never happened in their life. To cooperate and communicate with

others from outside of their own community, especially with those whom they barely know each other. For those who always feel comfortable in their own working environment, the globalization and virtual world created by the Internet push them to open or to walk out of their ivory tower. In this case, communication to people in academic community becomes much more important than before.

From the innovation theory (Rogers, 1971), in a traditional society, farmers and workers as lagers still could be survived from a changing process. But, no one knows whether this is true in the information society, especially in the academic community, survival with dignity, respect is the requisite. From science communication theory (Snow, 1980), people from scientific (including technological) community and from literary community, historically barely understand each other. In the coming information age, it seems the two groups must communicate in order to help each other in their own work with the new media environment, combined with multi-media, multi-lingual and globalization, also with their own local culture.

With this proposition, we started to find suitable cases to study. Why are these three cases? The reasons can be summarized as: typical, ideal, available and easy for me to access. Three key persons, Lewis Lancaster at UC Berkeley, Testuya Katsumura at Kyoto University, and Ching-chun Hsieh at Academia Sinica, who help me and foster this study.

Three cases have been chosen for this study since 1998. They are the University of California at Berkeley, Institute for Research in Humanities at Kyoto University, and the Digital

Museum Project of Academia Sinica (1998-1999). The research methods like participant observation, interview, questionnaire survey and content analysis are applied in this study.

In brief, Communication and collaboration happen in all settings (group meetings, formal meetings, seminars, conferences, within group, cross groups, domestic, international, etc.) while digitalization becomes the objective of an institution or organization or a group of people. Content holders, content experts, computer/internet experts and all others involved in the digitalized work, communicate and collaborate with each other all the time in everywhere. Precisely speaking, interdisciplinary or even multidisciplinary team is mainly the core of communication in all the chosen three cases.

In the adoption process of digitalization, there is no significant difference of individuals among the three cases. But, there are some different patterns of collaboration with different groups in the three cases. In general, the two cultures do exist in the three cases no matter what their own culture is, that is, there are some communication problems or differences between technical people and literary people, although they all realize it is important to share information and to communicate to each other in the information age.

In conclusion, communication plays the key role in the digitalization of three cases. The term “communication” used here, represented as communication “pattern,” also can be called as “culture.” People play the second important role in the digitalization process. Then, timing is the third key role also pushing the speed of digitalization.

In Chinese culture, to find the right, competent person, also with a fully support or to give the authority to do things, is always making much progress. Scholars in Buddhism may recall the case of Shaun Tsuan to translate Buddhist texts in Tang Dynasty, he got an exclusively support, with enough qualified people and money from the emperor. Maybe we can add one more factor, the right timing, to Tang's case. In short, the project of Digital Museum in Taiwan is more like this case. Other two cases are waiting for more explanation in the future.

“I hope, ‘Consilience but remaining diversity’ will be a shared common ground while reconstructing humanities in the rapid developing technological society.... We must live together in peace, with collaboration to fulfill the work of reconstruction of humanities in using technology.” (Fe, 2001)⁶

Ethical Issues in Collaboration, and Digitalization

Intellectual property right, copyright, loyalties, money matters, and courtesy are the ethical issues we see from those projects of collaboration, and digitalization. In Chinese history, intellectual property right and copyright were not clear-cut as what we understand today among intellectual people. In most cases, it was only involved in the information of courtesy with acknowledge or in citation. Even in the 21st century, among scholars and professors, they don't have a custom or habit to keep every source in record with names, dates and locations. Ethical issues were even not taught or addressed in research methods classes.

This does not mean that Chinese people don't care about copyright, intellectual property and creative work instead they do respect knowledge and intellectuals much. It can be easily found in all Chinese literatures, the educated people got the highest respect everywhere at all the

time, in the past and the present. To be an educated person, to a great extent, usually does not care much about money (his income) for he will be taken care by his family, his community, his government or his king (in ancient time). Therefore, people despise the conduct of selling knowledge, such as to teach or to sell books if it is for gaining profits.

With this cultural background in collaboration and digitalization, there are some disputes and debates related to ethics or to copyright law among different people in different arenas such as within a country, between nations.

Typical Examples of Information Ethics in the Digital Age

There are three examples represented a typical case that is not addressed in most of the literatures in communication ethics. These three are much related to ‘intellectual property right,’ also with some problems of ‘access’ in practice, but much more complicated than Mason’s concept. For ethical concern, the following discussion will in anonymous way, i.e., using symbols to represent the subjects instead of real names.

Example One (within the same culture)

X represents the researcher also the IT developer, who has the knowledge to the content also familiar to the technology of digitalization.

Y represents the content holder(s), who has/have knowledge to the collections and archives, but no knowledge to the technique of IT, no idea of the impact of the digitalization on the cultural collections neither.

Z represents one reviewer of the research project.

X, Y, and Z are living in the same cultural surroundings, but X and Z hold higher degrees from western countries, also with much more experience than Y dealing with people from western culture.

The story is:

X wants to join the national digital project by doing a digitalization of Y's collections and archives, recently. In fact, X is a scholar in the field related to Y's holdings and has been involved in the digitalization since 1997. X and Y know each other for years. Therefore, Y agrees to let X digitalize his collections. In this case, there is no question between X and Y in the collaboration. But, Z has wondered this project proposed by X involved ethical issues, then feels reluctant to approve X's application.

Z thought X took advantage from Y's absence of digitalization. Y might not be able to catch up the technique even if he can learn from X by contract. There is always a risk of "information gap," or even "digital divide" between X and Y. Indeed, X himself cannot do this project alone if no content at hands. In most of other projects like the National Palace Museum, researchers are not only content holders but also the IT developers.

It seems Z wants to protect Y (the content holder) because there is no better solution to the intellectual property right after the digitalization of those collections. But, in a long run, someone else finally will digitalize Y's holdings. The worry of Z is still there if Y didn't become a sophisticated IT developer.

The controversy is still going on.

Example Two (within the same culture)

V represents the scholar who is leading a research team in a research-oriented institution with a fully technical support from the institution's computing center. V is an expert to the content, having the exclusively authorized copyright to use the content for digitalization, also with constant grants to support his research. V is much like classic Chinese scholar although he got his Ph. D. from a distinguished American private university.

W represents the IT developer, who has some knowledge to digitalization, but without much knowledge to the content, assigned to help V at the very beginning in digitalization. W does not have a higher degree from any western country or with any experience dealing with western people before doing the digitalization for V.

The story is:

V has been working on the content, also collecting some related, valuable data for years. W is an engineer working as a data manager at the computing center, also with some assignments to help scholars from different fields in the institution. The role of the computing center at the institution mainly was doing service. In this setting, a great deal of W's job is doing maintenance and keeping service in routine. Besides, W is officially assigned to help V to develop V's holding of content into digitalization.

At the very beginning, V and W worked together as a team very well for they concentrated much on learning from each other, with much attention to communication and collaboration on how to do the digitalization. This is about 1998, and last to the year of 2000, even till early 2001. V and W always show together while presenting papers or reports in meetings and conferences

both in domestic and international arena. Both names are put together in the paper. It is still true even in an international conference in last September. In all these settings, V is the first author to present the major idea and content, then W is the second author with technical presentation to show how the content can be demonstrated in digital form.

It seems their work is divided into two separate parts, the content and the digitalized outcome, while looking it without keen eyes. In fact, the outcome of digitalization is no longer the old one, i.e., the knowledge with the original content itself has been evolved as a new knowledge after digitalization. This is the same happened to V and W. Afterwards, V and W sometimes can demonstrate or present their work alone, without the other's presence although they do feel a little confident on their weak part, either technical or domain knowledge. However, V feels much uncomfortable, unhappy with this situation if W presents their work without his consent or without him for the whole research is under his leadership, also with his academic expertise. V insists W is an assistant, technician, even like a graduate student in his project for years. W will not be able to substitute his position in the field of the domain (content) knowledge. From V's standpoint, W is like a thief stealing his property (knowledge), even robbing (take advantage of) his fame from this pioneer research. In fact, W does not know V's anger and concern in detail for V most time reacts very gentlemanly and indirectly as a traditional Chinese scholar.

The conflict between V and W is not simply a communication problem, instead, is a typical case of intellectual property about the knowledge after digitalization. The knowledge/property is not like different authors of chapters in one book, is not like some collaborated devices invented by a group or a team shared the common loyalties. It is a new brand of knowledge with lots of

prospective in itself, also with much potential in the future. Persons who create the knowledge are also changing.

In this story, V and W are facing the changing working relationship but still with no better solution yet. There are several similar examples under studies.

Example Three (with multi-culture settings)

A represents a research group also the IT developer, who has the knowledge to the content, is also familiar to the technology of digitalization and with some financial support to do digitalization.

B represents another research group also the IT developer, who has the knowledge to the content also familiar to the technology of digitalization and with some financial support to do digitalization.

C represents an institution also the content holder, who has knowledge to the original collections and archives, with a few knowledge to the technology of digitalization also without money to do it.

D represents the third party in this case, with no data (not a content holder), no technology, but familiar to the content knowledge. D is much like a broker who wants to be the boss to control the distribution of digitalized materials by contract in the name of a non-profit organization.

A and C are living in the similar cultural surrounding, in a sense of the same habitants with Chinese culture

The story is:

A, B, C and D are an inner club of a research area, scattered in different countries. They become much closer than the old time for the extra work of digitalization brings them together. A, B and C have been working on the digitalization for a couple of years, mainly on the metadata of the data and holdings. Besides of the domain knowledge of their field, A and B are much sophisticated with the IT and C has the privilege to content holdings. With some financial support, A, B and D meet to share the progress of the digitalization work at least twice a year. Most of the gatherings, C was not be able to show up for the shortage of traveling funds.

In the past two years, a major part of their digitalization work was approaching to the stage could be opened to, used by scholars and researchers. At that time, D proposed the idea to initiate a cooperative organization under the name of D's institution to unite the work of A, B and C by a contract. Under this proposal, D supports A, B and C with a proportionate funding for continuing digitalization projects, also with free access to the database. After the work is finished, the database will be also free to all scholars or institutions in the world.

It sounds great to all users for the 'access' is free. But, 'the intellectual property right' becomes ambiguous to A, B and C. A is much unpleasant with D's role in this play. For the future, it seems D is like a controller and the owner of the database with no contribution to contents and IT development except for a little fund for B and C, but gain all the credits.

The dispute is not solved yet.

Conclusion

As previously said, in an information society, people are facing a totally new world, with new knowledge, new experience and new behavioral pattern. In this new culture, the ethical issues must be different from the old one, at least have a different dimension in practice from the old. Mason's assertion of information ethics can be a reference to start, however, all the four ethical issues need to be carefully studied in further, especially in the case of international collaboration, in the case of content holders, the Internet developers and distributors. We also recommend that Chinese ethics mainly suggest "consilience of the real world and fairness, justice in a society are the supreme concern in human society," can be an answer to the question of problems caused in virtual world.

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Notes

¹ In the early 1980's, Dr. Hsieh is the first person to build the full-text database for the twenty-five dynasties history in Chinese. He is also the inventor for CCCII (Chinese Character Code for Information Interchange), has been adopted and used by most of the East Asia libraries in the States, also in Taiwan too. Besides, he was the first person leading the research project of National Digital Museum in Taiwan in 1998, now is the director of National Digital Archives Program (NDAP). He is well-known to scholars in Chinese studies in Japan, the United States, the Great Britain, China, and Taiwan, not only because of his pioneer studies of computerizing Chinese old texts but also because of his ideas of information and digitalization. He has been invited as visiting professor and scholar to Peking University, Kyoto University, the University of California at Berkeley since 1997. All the invitations are related to the information and digitalization.

² According to a survey done by Internet Software Consortium in the year of 2001 (Kiiski and Pohjola, 2002, pp.297-298), "the internet domain name system indicates that in January 2001 there were 110 million computer hosts on the Internet." To compare to the year of 1991 in January, the number was only 376,000.

³ This is also related to Hsieh's early research on Chinese computerize, that is data entry, typesetting with Chinese characters by computer.

⁴ Lian, S. C. (2000). (Ed.). *Far East English-Chinese, Chinese-English Dictionary*. Taipei: Far East Book Co.

⁵ The former Minister of Finance, Lee, K. T., promoted a movement called "To Reinforce on the Sixth Ethics," which is focused on the relationship of an individual and his organization (society), a couple of years ago. But, his promotion did not gain much attention for many people believe the sixth ethics is included in the *Five Ethics*.

⁶ See detail in Fe, X. T. (2002, Oct. 8-10). A retrospect to the 20th century and a foresight for the 21st century—the development of science and technology, and the reconstruction of humanities. Keynote speech delivered to the *Conference of Modernization and Chinese Culture*, held at National Library, Taipei, Taiwan.