

Ethical Behaviors in E-Commerce Based Construction Procurement Process

February 2006

BY

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A Thesis to be submitted to School of Urban Development, Queensland University of
Technology for the Degree of Master of Science.

KEYWORDS: Ethical behaviours, construction procurement, e-commerce, questionnaire survey.

ABSTRACT: Electronic commerce is increasingly applied in commercial fields, no exception to construction procurement process. But coming with it, also creates many problems, many of them remain as hot issues for both researchers and stakeholders in industries and have not been solved, though enormous efforts have been offered from different parties involved, among which, ethics in e-commerce enabled construction procurement process stays on top of all. This thesis investigates ethical issues related to the e-commerce application in the construction industry.

Research methods used in this study include a thorough literature review, a questionnaire survey, interviews and a case study. These studies were conducted in August 2004. The samples studied in my thesis included a group of 30 experienced construction professionals who were attending a MBA distance learning programme offered by The Hong Kong Polytechnic University in Beijing.

Through these studies, various construction ethical issues such as computer ethics and corruption in the e-commerce enabled construction procurement process are thoroughly discussed and patterns of ethical behaviors were identified. Specifically, through the questionnaire and interviews, it was identified that the majority of the respondents (70%) agreed that ethical atmosphere is almost nonexistent in the China construction industry. The majority (78%) also agreed that there was only a little ethical awareness. However,

the majority of respondents (51%) believed that there is a positive relationship between ethical behavior and long-term profitability of the company. On the other hand, the respondents' views were divided when judging the relationship between ethical behavior and short-term profitability as 40% believed the relationship between ethical behavior and short-term profitability of the company was uncritical, while 43% believed there was a strong relationship between them. The majority of respondents (63%) also confirmed that ethics was never discussed with companies. When asked on the difficulties encountered in developing a strong ethical awareness in the company, respondents cited various reasons including the lack of support from senior management; prevailing trend in the industry, negative impact on long-term and short-term profitability. The majority of respondents (90%) also chose "keep silent" when asked if they spotted unethical behaviors. Finally, the majority of respondents (90%) believed that unethical behaviors increase the cost of procurement by at least 10%.

The interviews and case study reinforced the findings and revealed reasons for the ethical behaviors in China construction industry. Based on these findings, this study has proposed several remedial measures in order to prevent unethical behaviors. In addition, scope for further research is also identified.

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STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other educational institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signed _____

Vera Li

Date _____

ACKNOWLEDGEMENT

I would like to express my deepest appreciation and gratitude to my supervisor Professor Martin Skitmore for his supervision, support and guidance. The completion of this dissertation would not have been possible without his help and encouragement.

I am deeply indebted to the School of Accounting and Finance, The Hong Kong Polytechnic University, which supported my part-time study.

I wish to thank my husband for his tremendous support during these years. Without his continuing encouragement and care, it would be impossible for me to complete this study.

CHAPTER 1: INTRODUCTION

1.1 Background to the research

Ethics is an important issue to business activities. The abundant literature on implementing a code of ethics in a business environment is the evidence of its importance. However, emphasis has been placed on the formal procedure of positive environment development and implementation, while very little attention has been given on how to implement to the individuals who must follow the code. A code of ethics theoretically restates a person's moral ideals. Adhering to moral ideals requires integrity and courage of convictions, it is not easy to do what you know is "right" (Lantos, 1987). It is even more difficult to follow a code of ethics that runs counter to your own values (Lantos, 1987).

Like all the other business fields, construction activities are conducted by human beings, in which, personal ethics or individual morality occupies a dominant role in affecting the whole procedure, from the very beginning to the very end and the consequences. As people realized, one of the major results caused by unethical activities is the increased cost and reduced fees for contractors during the procedure. No matter what kind of unethical acts, their main purpose is to converse organizational benefit to individual benefit, which results in higher cost incurred to the client than that of formal standard and bad quality in most of cases (Bond, 1990).

1.2 Research problem

This research aims to investigate ethical issues related to the construction procurement process through the use of e-commerce in China.

1.3 Research objectives

In past years, countless research was made on ethics in electronic commerce, and many others poured ink on ethics in construction procurement, but very few studies have combined these two parts and addressed ethics in construction procurement through electronics, which is exactly the very issue causing problems and laying puzzlement on the whole industry. We intend to focus on this specific area and try to identify problems existed in practice. We hope to identify real situations regarding ethics involved in construction procurement through e-commerce, and then, analyze the causes for those problems. The next step is that we hope to work out suitable solutions on how to improve the situations. In order to offer valuable suggestions to participants in this industry, we are going to work out a procedure/model of construction procurement through e-commerce which could avoid unethical or wrong doings. This research aims to develop an appropriate business model in which the level of trust among users and confidentiality of information can be maintained. In developing such a model, the following main questions should be considered:

Who should own and operate a construction e-commerce system?

Which legal system should be used in arbitration where users/customers are from different countries?

It is expected that this research project will result in a business model, together with a set of codes of practice, which can be used as a point of reference for developing construction e-commerce systems. Finally, with the information collected during the research period, we hope to give some hints to researchers who are interested in the same or similar issues in order to deepen and enhance the studies in future time.

1.4 Research methodology

Any issues regarding ethics are proved to be extremely difficult as they are involved in reading people's mind exactly and finding their real thinking. Primary research methods include questionnaire survey, interviews and case study.

1.5 Structure of dissertation

This paper has been drawn out based on six parts frame. Besides the first Chapter as introduction, researchers listed a large amount of information on literature review, which all concerned with the issue of ethics in overall procurement procedure. In Chapter 3, research methodologies are introduced and explained in detail. Then, data are collected and analyzed in next Chapter. Based on sufficient data collected and analysis in detail, Chapter 4 presents a support to establish a procurement process model as well as suggestion to all participants in the construction industry. As the last part, Chapter 6 draws out conclusions based on former parts. Limitations of the research are addressed and suggestions are offered to researchers interested in similar topic for their future studies.

CHAPTER 2: LITERATURE REVIEW

Thousands of studies have addressed the issue of ethics, including ethics in electronic commerce. In this chapter, both general and specific ethics are discussed. Topics include ethics in general meaning, computer ethics, issue of privacy, ethics concerned with computer based performance monitoring, ethics involved in procurement through electronic commerce, issue on copy right, virtue ethics for computational agents, ethics of online communication, and ethics concerning with public procurement corruption.

2.1 Ethics in general

According to Webster's Dictionary, ethics is defined as "Conforming to accepted professional standards of conduct". In Encarta's Encyclopedia, ethics is defined as "A system of moral principles governing the appropriate conduct for an individual or group". Besides these definitions, people generate their own thoughts on ethics through personal experience. Ben Maibach, President of Barton Malow believes "When all things appear equal, I believe our profitability may depend on our good name. An excellent reputation is a differentiating competitive advantage". Ben Maibach, President of Barton Malow stated: "People tend to rationalize unethical behavior by saying, "that's business." I do not believe being unethical is a way to run business. Throughout our business career and long after, our reputation will be known and remembered."

Professional ethics is a significant topic since they affect professionals at work. The

abundant literature on the “how to’s” of implementing a code of ethics in a business environment is evidence of its importance. However emphasis has been placed on the formal procedure of code development and implementation, while very little attention has been given to the individuals who must follow the code (Dean, 1992). A code of ethics theoretically restates a person’s moral ideals. Adhering to moral ideals requires integrity and courage of convictions. It is not easy to do what knows to be “right”. It is even more difficult to follow a code of ethics that runs counter to your own values (Lantos, 1987).

The relationship between a code of ethics and individual values has long been studied by evaluating the emotional reactions of successful construction procurement staff. Frankel (1989) suggests that a code embodies the collective conscience of profession and is testimony to the group’s recognition of its moral dimension. Problems arise if there is not a common acceptance of the “collective conscience.” If the code is questioned or not respected, the spirit along with the code may be violated. Therefore, it is important to determine actual feelings about the ethical determinants of code values.

Terrell Ward Bynum and James H. Moor (1998) point out topics of ethics includes rights and responsibilities, quality of life issues, equity and access, the use of power and risk, privacy, and copyright issues and how they effect individuals, institutions, organizations, cultures, communities, and nations. Like Snow (1959), one of his goals is to help bridge the gap between the ‘two cultures’ of the scientific and humanities communities: that it is the advances of science that have raised many of our ‘new’ moral and social problems,

and it will take some hard thinking and action to solve them. Those from the ‘two cultures’ must work together to solve these problems. Those from the scientific community must bring a greater technical understanding of the underpinnings of the technologies involved; those from the humanities must bring a basis on which to make moral judgments and choose social and political alternatives as well.

2.2 Construction ethics

What does ethics mean in the construction industry? How does people perceive and stick to ethics in the construction industry? As it shows, the term “ethics” was perhaps overused in the 1990s, but the notions behind it obviously were not. A survey implemented in 1997 indicated that some 56 percent of employees in the construction industry felt with pressure to act unethically or illegally on the job. Today, many of these ethical lapses have caught up to their perpetrators — all one has to do is to turn on the television to hear tales of corporate malfeasance. The names Enron, Arthur Andersen, WorldCom, Global Crossing, and even Martha Stewart all invoke notions of greed and dishonesty. The construction industry, with its low-price mentality, stiff competition, and razor-thin margins, presents a ripe environment for ethical dilemmas.

Michael Davis (1991) notes that in thinking like professionals, construction participants must remember the place of a code of ethics in the practice of his/her profession: Construction Managers often perceive themselves as having a special duty to protect the financial well-being of the company. Engineering codes are assigned to engineers as a special duty to protect the public. Whether these roles are appropriate and especially

whether this narrow conception of the role of managers is adequate is a matter of debate.

Construction companies do have a special obligation to the health and safety of the public. Participants in construction projects must often place their social responsibility over the objectives of organization. Just as people must know the rules of baseball games to know how to play the game, construction participants must know construction ethics. For example, project managers or engineers should weigh safety as important as profits, or even give safety a preference over profits. Sometimes a cost/benefit analysis is not enough, especially when lives are at stake.

In his article "Explaining Wrongdoing," Michael Davis (1989) emphasizes the need for professionals to distance themselves from a "microscopic" way of looking at their role within the corporation, to look up from their given tasks to see the larger implication of the work they perform for the society. In essence, Davis argues that problems associated with professional ethics center on these fundamental questions of social obligation. Using the famous Challenger disaster as a case study, Davis shows that while no one broke the law in Challenger, there was clearly wrongdoing on the part of Morton Thiokol's managers and engineers. "For a construction engineer, safety is the paramount consideration. The project managers and engineers could not say the launch would be safe. So, Lund should have delayed the launch. In that case, seven people died, in part at least, because he did not do what, as a project manager or as an engineer, he was supposed to do." (Davis, 1989) This is not simply limited to highly publicized disasters. In all fields of construction, concern over safety, and the participant's responsibility for

ensuring it, is paramount. In his article "Safety - An Important Responsibility," Carlton Robinson (1991) argues that safety is an especially critical factor for transport engineers and their managers. Given the volume of traffic on roads, safety must come before cost considerations in highway design and construction. Carlton argues that if, at present, increased safety is not the primary goal in engineering design and construction projects, it should be. Safety is a social, not a legal obligation. Engineers and their managers must always keep their obligations to the public welfare at the fore when making design and management decisions.

Another example on the importance of choosing social responsibility over the law involves the Soldier of Fortune guns-for-hire classified advertising cases. In his article, Don Tomlinson (1990) asks whether they are the first professionals or the first human beings to argue the current practice that placing guns-for-hire advertisements was not illegal; however, these advertisements were immoral and people died because of them. Soldier of Fortune acted irresponsibly toward the public, and "Law cannot shield anyone from the most basic duty all human beings owe all other human beings: respect for life. Law and ethics are not one and the same. Further, using law as a justification for conduct which is socially irresponsible is socially irresponsible itself." The same duties can be applied to construction design and management.

Construction quality engineering is a necessity. It means that there is a need for creative engineering and ethical corporate practice. The American Society of Civil Engineering Code of Ethics (1996) states "engineers must hold the public safety, welfare, and health

paramount and use our knowledge and skill for the enhancement of human welfare." When managers, engineers, corporate owners, contractors, subcontractors and inspectors take pride and responsibility for their work, the entire construction profession benefits. According to Charlton Moorman (1989), ethical engineering practice positively affects engineering creativity and public relations.

Professional engineering societies play a significant role in ensuring that safety standards are maintained, and it is imperative that individual professional adhere to what their society mandates. Michael Davis (1989) notes that when thinking like a professional, one must remember the code of ethics in the practice of his/her profession.

Robertson (1987) indicated that project managers and engineers should not only do as their profession's code requires, but should also support it indirectly by encouraging others to do as it requires and by criticizing, ostracizing, or otherwise calling to account those who do not. Harold pointed out that they should support their profession's code in these ways for at least four reasons. First, construction professionals should support their profession's code because supporting it will help protect them and those they care about from being injured. Second, supporting the code will also help assure a working environment in which it will be easier than it would otherwise be to resist pressures to do much. Third, one should support their profession's code because supporting it helps make their profession a practice of what they need not feel morally justified embarrassment, shame, or guilt. And fourth, one has an obligation of fairness to do his part insofar as he claims to be a professional and other professionals are doing their part

in generating these benefits for the entire construction industry.

Zarkada-Fraser and Skitmore (2000) conducted an empirical investigation in which they studied the attitudes and behavioral intent towards collusive tendering of key individuals in the construction tendering process. Factors that determine these attitudes are also explored. This study indicated that there is a minority of decision-makers that admit they would consider participating in some form of collusive tendering agreement under certain circumstances.

There has been a dramatic increase in the interest in applied ethics as it relates to the construction industry. This interest has focused on the introduction, examination and application of applied professional ethics as it relates to construction training program. This has been spurred, at least in part, by the liability insurance crisis, a product of both the bad publicity given the industry in bid-rigging cases (some of which have been given prominent media coverage), and increased public interest in issues of environmental impact and safety. Other factors include the increased rate of litigation and skyrocketing awards given plaintiffs by the courts. Society, through the media and the courts, is demanding high standards of professional competence and performance. Constructors have been aware of their social responsibilities and prepare themselves to reflect critically on the moral dilemmas they are confronting. They are fulfilling the resultant moral obligations to the public. The public acquires an understanding of the extent and limit of the responsibilities of the constructors.

Since 1982, the Construction Management Association of America (CMAA) has taken a leadership role in regard to ethical issues impacting the construction management industry, including the setting of ethical standards of practice for the Professional Construction Manager.

The Board of Directors of CMAA adopted the following *Code of Professional Ethics of the Construction Manager* and recommended that it be accepted and supported by the CM industry and the membership of the CMAA as a guide to the execution of the individual construction manager's professional duties.

Corporate and individual practitioner members of Construction Management Association of America make a commitment to conduct themselves and their practice in accordance with the Code of Professional Ethics of the Construction Manager.

[Please refer to website for further information: (<http://cmaanet.org/ethics.php>)]

1. Client Service. I will serve my clients with honesty, integrity, competence, and objectivity, establishing a relationship of trust and confidence and furnishing my best skills and judgment consistent with the interests of my client.

2. Representation of Qualifications. I will only accept assignments for which I am qualified by my education, training, professional experience and technical competence, and I will assign staff to projects in accordance with their qualifications and

commensurate with the services to be provided.

3. Standards of Practice. I will furnish my services in a manner consistent with the established and accepted standards of the profession and with the laws and regulations which govern its practice.

4. Fair Competition. I will build my professional reputation on the basis of my direct experience and service provided, and I will compete fairly and respectfully with my professional colleagues.

5. Conflicts of Interest. I will seek to avoid any and all conflicts of interest and will immediately acknowledge any influences and offer to withdraw from any assignment when any actual conflict exists which may impair my objectivity or integrity in the service of my clients.

6. Fair Compensation. I will negotiate fairly and openly with my clients in establishing a basis for compensation, and I will charge fees and expenses that are reasonable and commensurate with the services to be provided and the responsibilities and risks to be assumed.

7. Release of Information. I will release public statements that are truthful and objective, and I will keep information and records confidential when appropriate and protect the proprietary interests of my clients and professional colleagues.

8. Public Welfare. I will not participate in any racial, sexual or political discrimination related to any assignment I may undertake. I will avoid any conduct that would be considered unethical or will interfere or conflict with any laws, statutes or regulations, and I will uphold the safety, health and welfare of the public in the performance of my professional duties.

9. Professional Development. I will continue to develop my professional knowledge and competency as a practitioner, and I will contribute to the advancement of CM practice as a profession by fostering research and education and through the encouragement of subordinates and fellow practitioners.

10. Integrity of the Profession. I will avoid actions which promote my own self-interest at the expense of the profession, and I will uphold the standards of the construction management profession with honor and dignity.

The Latham report has highlighted the need for the construction industry to be more competitive and to aim to reduce construction costs by 30% (Latham, 1994). Construction organizations would argue that tender prices already have reduced by 24% in real terms since 1990 and that the profit margin on construction work is 1-2% of the construction price (Agapiou et al., 1998). Major building corporations become larger by means of acquisition or merger. Smaller corporations in order to survive are seeking niche areas, while medium-sized firms are worrying due to acquisition by larger

construction firms. The trend towards consolidation in the sector, driven by the need for reducing costs, has meant that large construction firms now control large percentage of market sales of building materials. E-commerce application is a growing trend, particularly with smaller companies sourcing goods from the cheapest source through the cheapest method. Larger corporations have to respond by sourcing goods from the lowest cost base, irrespective of whether they buy from overseas market, in which, electronic commerce is playing a more and more important role.

In order to reduce cost in every process, besides procurement through e-commerce, there are many areas for consideration, e.g., avoiding over-specification; focusing on the interface between design and construction; using more standard and pre-assembled components; involving suppliers in the design process; using more off-site manufacturing and assemble; and most recently, procuring through internet (Long *et al.*, 2001).

Many of the suggestions for savings are influenced strongly by the supply chain, so there are opportunities to save on the cost of materials and components in the chain. Construction firms seeking to acquire materials and components at the best terms and conditions and with the best method need to understand the structure of the supplying industry and the way to do it as well. Supply terms include price, discounts, reliability and timing of deliveries, and importantly, the credit facilities for payment. All these activities could be conducted through Internet.

It becomes increasingly difficult to delineate accurately the borders of today's organization. Driven by IT's ability to produce ever cheaper unit costs for coordination, organizations are implementing, increasingly rapidly, new links for relating to each other. These links take many forms, such as electronic hierarchies and markets, strategic alliances, networked organizations and others. The new forms indicate an ongoing transformation of value chains due to technological change.

In a market economy, new technologies are perceived by companies (including construction companies) as a competitive advantage. E-commerce is a new technology that enhances traditional procurement procedure in terms of efficiency. Companies, being primarily interested in economic goals, may ask very limited questions about the safety and workability of a particular technology. This viewpoint causes problems which manifest themselves in many cases where the concerns of engineers and technicians in companies about decisions relating to a particular technology, say, e-commerce, clash with managers prone to overlooking these concerns in favor of organizational interests. The problem can be seen as a structural one that is inherent in the capitalistic system (Kallman, 1996). It can also be seen as an organizational or policy problem that requires changes in the organization to give engineers more authority in decision-making or to facilitate whistle-blowing on the part of engineers or technicians. The problems surrounding the misuse of technology is believed to lie in a lack of understanding of technology's inherently social and moral dimensions. Technology creates a moral situation, and this situation should provide the context for decision-making. Technology is also experimental (Paradice, 1991), and everyone involved with introducing a

particular technology needs to ask the question as to whether a real life experiments is warranted. Finally and most importantly, technology demands a moral sensibility, which recognized that business interests and technological interests alike need to be understood in the network of concrete relational contexts in which they are embedded.

Besides issues of morality derived from e-commerce, say, electronic commerce, procurement of materials in construction is also deeply impacted by Internet, in which, morality issue becomes an obstacle for involved parties which attempt to smooth the channel and reduce the cost as originally intended.

In the construction industry, the value of materials required to be purchased and used for any construction contract makes up a large proportion of the total contract sum. Typically materials account for 40-45% of the cost of all construction work (Agapoiu *et al.*, 1998). Maintaining an efficient and effective material procurement system and being able to purchase materials at the proper price, required quality and right time are essential for a contractor to gain advantages over its competitors in a competitive environment nowadays.

With the emergence of Internet technology, information is shared and exchanged through a common global network in a cheaper and more efficient way. Companies are now conducting their business using Web-based E-commerce system. Many believe that E-commerce can provide a win-win situation for both suppliers and buyers because E-commerce can provide an expanded marketplace within which buyers and suppliers can

communicate directly with each other. Online construction trading markets are not limited by the physical limitations of store spaces and can carry a much larger variety of products and different styles and sizes. At the same time, buyers can search through a wide range of products with low transaction costs at any time convenient to them. More importantly, the direct communication between buyers and suppliers will cut off the multiple layers of mid men between suppliers and buyers. These mid men take commissions and fees from both buyers and suppliers at the same time. The use of E-commerce will therefore directly benefit the buyers so they can efficiently purchase cheaper products with a variety of choices (Bakos 1991).

With the increase use of e-commerce in construction, many ethical issues are emerging to be bottleneck problems, and prove to be a real problem in the development and delivery of electronic commerce systems. There are many aspects of ethics that can affect electronic commerce system, but perhaps the most notable and worrying to both consumers and developers is that of trust and confidentiality. The issue of trust and confidentiality appears to be the most challenging one. However, the issue will be briefly discussed in the following paragraphs and its related importance and challenges will be further elaborated in the following chapters.

When talking about trust, we have to mention the issue of ethics held by adults. While experts have generally agreed ethics can't be taught to adults, it is possible to encourage an environment in which the right questions are asked at the right time. Business ethics weights ethical arguments and alternatives in a manner that considers the rights,

privileges and anticipated responses of all participants (that is, persons and groups likely to be affected). The participants' concept is important to developing a better understanding of business ethics. Most ethical problems arise because what seems right – and is right – to one party may be wrong to another.

Business must remember to take the human element into account or new technologies may be rejected to implement due to ethical consideration. Organizations may be heading for trouble if decisions are based solely on technological improvements, production schedules and perceived markets. Markets are not the same as customers. Internal talent often is wasted in the quest for a competitive edge (Artz, 2001).

The issue of trust in e-Commerce brings with it the need for protection of our fundamental human rights and the respect warranted between our cultures. Virtual relationships will only work if this goal is achieved. Making this information public is also a step in the right direction. Loosing touch of the human side of things, by use of e-mail, or chatting, will more than likely lead to the failure of genuine trust that would normally be acquired through human interaction. In addition to this, customers need to feel respected, and currently the easiest way for them to be respected is to meet in person. If this is not possible, extreme care must be taken to insure that there are many additional inroads for the customer to your business. Only then will trust be established and a repeat-customer be made.

But procurement through e-commerce reduces greatly the necessity and chances of

meeting customers in person. Establishing trust under this situation becomes a real challenge for participants in the construction field. Without meeting customers in person, without basic trust among each other, it will be very difficult to collect sufficient and proper information, so insufficient information due to the lack of direct contacts is another tuff problem need to be handle.

Undesirable lack of information can result in total chaos within a company. Being team players, we must realize that our work is not only a means by which we can achieve advancement or promotions, but a means by which society as a whole can advance through constructive cooperation. We must even be careful of 'well-intended' actions that accomplish a goal. Again, this also applies to your affiliates who are going to be using whatever service you are providing.

2.3 Computer ethics

Whenever and wherever people talk about e-commerce based procurement, computer ethics would be mentioned. As the basic tool for electronic commerce, computer works as bricks and cement like building a house, so does computer ethics. No one could ever avoid this issue while talking about ethic in electronic commerce.

What is computer ethics? Moor (1985) proposed that the central aim of computer ethics is to formulate policies to guide individuals and collective actions in the use of computer technology. Brey (2000) agreed with this proposal in his study, with the addition that

not just the use of computer technology, but also other practices that involve computing technology, such as its development or management, require the formulation of policy guidelines. If computer ethics is conceived in this way, it is clear that it is a branch of applied ethics. Whereas its counterpart, theoretical ethics, is concerned with general aspects of morality, applied ethics is concerned with the study of morality in particular domains of human practice. Moreover, the aim of applied ethics is not merely to arrive at well-supported moral analysis, but also to use such analyses to affect the discourse, policies and practices that are prevalent in its domain of study (Brey, 2000).

According to Brey (2000), scope of computer ethics includes individual and collective practices that somehow essentially involve computers. This includes practices like the use, development, regulation, management, advocacy and advertisement of computer technology. Also included should be the products of such actions, e.g., computer systems and software, manuals, advertisements, and laws and policies regulating the use of computers.

In addition, according to Hoven (1997), computer ethics, like other branches, of applied ethics, often involves the application of existing moral theory to practices that are under study. So the application of moral theory is certainly one of the central activities in computer ethics. For example, the question of what amount of protection should be granted to software developers against the copying of their programs may be answered by intellectual property rights law, and the question of what actions governments should take in helping citizens have access to computers may be answered by common laws

enacted by governments.

Applying moral theory is only part of what computer ethicists do, however. As Moor (1985) pointed out, the changing settings and practices that emerge with new computer technology may yield new values, as well as require the reconsideration of old values. There may also be new moral dilemma's brought together in new settings and practices. It may then be found that existing moral theory has not adequately theorized these values and value conflicts. In general, it is part of the task of computer ethics to further develop and modify existing moral theory when existing theory is insufficient or inadequate in light of new demands generated by new practices involving computer technology. Brey (2000) claims that a large part of the research in computer ethics is not normative in this sense, but is instead descriptive: it is concerned with describing aspects of reality and with proposing, defending, analyzing or applying descriptive concepts and principles. Moor (1985) has claimed that much of the important work in computer ethics is devoted to proposing conceptual frameworks for understanding ethical problems involving computer technology. Brey (2000) argues a fourth important research activity in computer ethics, one that has not been recognized sufficiently by Moor (1985?). He claims that large part of work in computer ethics is not about the clarification of practices that have already generated moral controversy, but rather about revealing the moral import of practices that appear to be morally neutral. Many designs and uses of computer systems have important moral properties, which remain hidden because the technology and its relation to the context of use are too complex or are insufficiently well known. It is part of the job of computer ethics to make computer technology and its

uses transparent, in a way that reveals its morally relevant features.

The notion that computer technology can have moral properties is an extension of the notion that it can have political properties (Winner 1980; Sclove 1995; Pfaffenberger 1992; Akrich 1992). As Winner (1980) argued, technological artifacts and systems function much like laws, by constraining behavior and serving as frameworks for public order. Sclove (1995) has made the same point by identifying technical artifacts as elements of social structure. Sclove (1995, p.11) defines the social structure of a society as its 'background features that help define or regulate patterns of human interaction. Familiar examples include laws, dominant political and economic institutions, and systems of cultural belief'. He argues that technologies should also be included in this list, because they have the same kinds of structural effects as these other elements of social structure. Technologies are, for example, capable of coercing individuals to behave in certain ways, may provide opportunities and constraints, may affect cultural belief systems, and may require certain background conditions for them to function properly. Many such structural effects of technology may be analyzed from a moral point of view.

Much recent work in computer ethics is centrally concerned with the moral deciphering of computer technology. Friedman and Nissenbaum (1997), for example, is a study of bias in computer systems (see also Brey 1998). Biases in computer systems are usually not recognized, but Friedman and Nissenbaum (1997) tried to reveal the existence of bias by describing computer systems with bias and by bringing into view the possible

unjust consequences of such systems. Similarly, Brey (1999, 1998) is concerned with the consequences of the design of computer systems for the autonomy of users. A large part of the research is concerned with revealing the potential impacts of computer designs on the autonomy of users, and much less attention is devoted to theorizing and applying moral principles of autonomy. Other examples are Nissenbaum (1997), who revealed the moral importance of practices of registering public information. Blanchette (1998) revealed the importance of trust relations in cryptographic protocols and payment mechanisms. Introna and Nissenbaum (2000) deciphered the hidden politics of search engines. Agre and Mailloux (1997) revealed the implications for privacy of Intelligent Vehicle-Highway Systems. Finally, Tavanik (1999) analyzed the implications of data mining for privacy. The major contribution of all these studies is not so much found in the development or application of ethical theory, but rather in the description of computer technology and related practices in a way that reveals their moral importance.

2.4 Ethics in Electronic Commerce

Next to the computer ethics, comes the ethics in electronic commerce. As often being asked: Is E-commerce good, bad, or indifferent? Turkle (1995) enlisted deconstructive theory to celebrate the computer age as the embodiment of 'difference.' Since no longer just a theory, one can now live a 'virtual' life. Within a differential but ontologically detached field of signifiers, one can construct and reconstruction egos and environments from the bottom up and endlessly. Introna (2002), in contrast, enlisted the ethical philosophy of Emmanuel Levinas (1981) to condemn the same computer age for increasing the distance between flesh and blood of people. Mediating the face-to-face

relation between real people, allowing and encouraging communication at a distance, information technology would alienate individuals from the social immediacy productive of moral obligations and responsibilities.

Cavanaugh (2000) refined in his study about currently accepted norms concerning the fair use of electronic information to make them sensitive to the unique problems posed by genetic information. For example, it is currently an accepted principle of information – ethics while individuals should determine what information about themselves is gathered and stored. Yet in many cases, one cannot prevent one’s genetic information from being gathered and recorded if someone genetically related to one decides to have a genetic test. Again, it is commonly thought that individuals ought to have access to medical records pertaining to them. However, it is not clear whether one ought to have access to genetic information gathered from another that bears upon oneself. Cavanaugh (2000) believed that he resolved the core difficulty posed by genetic information: the discrepancy between the individualized character of consent and the group character of genetic information. In proposing this principle, he developed what he took to be implicit aspects of the currently accepted norms. Thus, he affirmed that his refinement is evolutionary, developing what remains implicit in the accepted norms.

For ethics existed in electronic commerce, Alkalimat (1999, p15) began his famous and eloquent essay, “The New Technological Imperative in Africa: Class Struggles on the Edge of Third-Wave Revolution” by stating the “twentieth century is ending as a global drama full of conflict and change, with humanity torn between hope and despair. For a

few the new century offers the wonders of a high-tech future, with wealth amid the birth of a new civilization". For information professionals, Elizabeth A. Buchman (1999) thought that their ethical obligations in this world-wide context are to play a major role in this separation between hope and despair. Buchanan (1999) believed that fundamental responsibilities of his and his fellow professionals continue to be free and open access to information. He questioned what ethical considerations demand our continued and renewed attention and discussed in his study many ethical issues involved in cross-cultural information transfer, those many levels of inequity, the issues surrounding the commodities of information worldwide, and the ethical dilemmas associated with international information transfer and service.

Ethics is an important element in all aspects of computing, and proves to be a real problem in the development and delivery of electronic commerce systems. There are many aspects of ethics that can affect electronic commerce systems, but perhaps the most notable and worrying to both consumers and developers is that of trust.

In a world where so much information is transmitted and shared electronically, ethical standards applied in general society and in different industries, are often ignored or forgotten. Ethical considerations in electronic commerce have been discussed for years, and possible solutions offered to participants which can encourage developers to consider ethical considerations and prove excellence and trust to the consumer. For example, In Hong Kong, the SAR government has enacted a set of laws to ensure the legality of electronic submission so that legal rights of users of the e-commerce system

can be protected.

Being honest and trustworthy is paramount in the success of any project. Steps must be taken early in the business/development cycle to secure trust among team members. This means that the use of text only chat and e-mail being kept to a bare minimum and more "human" forms of communication be arranged. Not only does this build up identification based trust, but also deterrence trust as well (Introna, 2002). The promotion of close contact also extends far into the realm of the public sector also. Customers must be secure in the fact that whomever they will be dealing with is honest, trustworthy, and qualified in what they are doing. Without trust, an organization cannot function effectively and society can either.

Besides being against the law for dishonoring such things, not doing so will most certainly mean outside entities. Another organization or a potential customer will undoubtedly push your choice aside in light of a more "moral" and trustworthy source.

Can you trust someone who has private information about you, like medical records, browsing habits, or food tastes? Privacy, and the security behind keeping information private is, by far, the best thing that a trust building exercise should strive for. This is the first step into establishing a long-lasting relationship with your partners, team members, or customers. If they feel at ease when it comes to working with you, it is less likely they will "defect" and go against the grain for their own personal benefit (is it really their fault; they just want to feel secure and the most secure thing they know is themselves...

It is your job to make them believe otherwise).

The principle of honesty extends to issues of confidentiality of information when one has made an explicit promise to honor confidentiality or, implicitly, when private information not directly related to the performance of one's duties becomes available. The *ethical* concern is to respect all obligations of confidentiality to employers, clients, and users. Not doing so will most certainly lead to a decrease in interested parties in your trust-lacking service.

2.5 Issues of privacy

As one of the main issues within electronic commerce procurement, privacy is becoming hot dog in both practical and academic fields. It is now commonplace to assert that privacy is becoming a very significant political issue. It is high on the political agendas of advanced industrial states. Many political candidates (including George W. Bush) have been forced to develop positions on the subject. The subject is always in the media. It is debated in the corporate boardrooms, as well as in the corridors of governments. Even a small industry has grown up in offering privacy-protective technologies.

To a significant extent, this heightened concern has been brought about by fears of how the Internet can track information on individuals without their knowledge or consent. Consumer concerns about privacy seem to be strong and rising. Eighty-four percent of Internet users surveyed by the Pew "Internet & American Life project" in 2000 expressed fear that web sites will obtain personal information without their knowledge.

In addition, the survey showed that Internet users want to know what web sites do with their personal information before they do it. Eighty-six percent of the Internet users favor “opt-in” policies requiring companies to get permission from users before any of their personal information is shared with third parties. At the same time, a Harris interactive survey found that, out of a list of eight public policy issues, 56 percent of adults responded that they are “very concerned” about a loss of personal privacy. The category was ranked second only to education, of which 58 percent said they were very concerned, and ahead of topics such as health care (54 percent), crime (54 percent) and taxes (52 percent) (Bennett, 2001).

Nowadays, it is common to assert that privacy becomes a very significant political issue existed in electronic commerce. It is high on the political agendas of advanced industrial states. Many political states (including George W. Bush) have been forced to develop positions on the subject. The subject always broadcasts via different media. It is debated in the corporate boardrooms, as well as in the corridors of government.

Bennett (2001) addressed in his article the questions of whether personal surveillance on the world-wide-web site is different in nature and intensity from that in the offline world. In his article, he presented a profile of the ways in which privacy problems were framed and addressed in the 1970s and 1990s. Based on an analysis of privacy news stories from 1999-2000, Bennet (2001) then presented a typology of the kinds of surveillance practices that have emerged as a result of Internet communications. Five practices were discussed and illustrated in his article, namely: surveillance by glitch, surveillance by

default, surveillance by design, surveillance by possession, and surveillance by subject. He offered some tentative conclusions about the progressive latency of tracking devices, about the complexity created by multi-sourcing, about the robustness of click stream data, and about the erosion of the distinction between the monitor and the monitored. These trends emphasized the need to reject analysis that frames out understanding of Internet surveillance in terms of its “impact” on society. Rather the Internet should be regarded as a “form of life” whose evolving structure becomes embedded in human consciousness and social practice, and whose architecture embodies an inherent valence that is gradually shifting away from the assumptions of anonymity upon which the Internet was originally designed.

In addition, more and more internet crimes occurred in which privacy is one of the main issues being hotly debated. On Friday the 16th of November 1999, one of the UK’s largest banks and online share dealers, the Halifax Bank plc, suspended their Internet share dealing after customers were able to gain access to other people’s accounts (BBC online, 2000). Although Internet brokerages are still in their infancy and expected to have some teething problems, it is this sort of breach of security that fails those consumers who place their trust in electronic commerce businesses. Trust that your money or shares will be secure is only one aspect. With its rapid growth, the Internet has generated concerns over information privacy. Information Privacy is the interest an individual has in controlling, or at least significantly influencing, the handling of data about themselves (Clarke, 1997).

Privacy covers, items such as, details supplied to electronic commerce companies when, for example, making a purchase, will remain private, that will not be sold to a third party, or become part of a junk e-mail campaign.

Successful electronic commerce in one instance has (as was missing in the Halifax Bank example) a requirement and duty to ensure that personal privacy and security when logging into a website. It must try and prevent any of this information being available to unauthorized users. Often e-mail messages are only transferred using plain text and they can very easily be scanned using specialist-filtering software. However, when subscribing to an Internet Service Provider, users are unlikely to be told this by the company. Perhaps an oversight, perhaps deliberate, but surely unethical. And additional e-mail problem is the easy ability to forge sender or recipient identity.

Recent studies have conducted surveys that have assessed the attitude that Internet users have towards privacy on-line, which have revealed that a large number are still unsure as to whether the transactions they place over the Internet really are secure (Scollay, 1998). In addition, this should worry electronic commerce businesses, with so many potential online shoppers to attract their cyber storefronts.

A large number of web sites, which require users to create a number name, also ask for personal details. These details are then often sold on to companies to aid in the marketing and selling of their products. However it must be said, that particularly in China, there are a large number of companies, which do not partake in this type of scam

or at least inform individuals that their data may be passed on. Cookies are one of the most commonly used computing technologies allowing the tracing of web users.

The concern cover Internet security, particularly with the electronic commerce has placed the computer and Internet industry in a difficult position. It would seem that self-regulation is ineffective. A study by Georgetown University found that out of the 100 most frequently visited web sites, 94 percent of them have privacy disclosure (Detroit Free Press, 1999.)

2.6 Ethics concerned with computer based performance monitoring

Another important aspect is that ethics concerned with computer based performance monitoring attracts much attention from both professionals and participants.

Ball (2001) discussed in his study about ethical issues surrounding computer based performance monitoring (CBPM) in the workplace. Its central argument is that any investigation of ethical monitoring practice is inadequate if it simply applies best practice guidelines to any one context to indicate, whether practice is on balance, 'ethical' or not (Alder 1998).

There are three implications of this argument. The first is that it is vital for any empirical investigation of the ethics of CBPM practice to take into account not only its compliance with pre-existing 'best practice' guidelines, but also the social relations which pervade the context of its application. In the second implication, the CBPM is treated as

something whose effects are measurable and identifiable. The third is that existing debates against which this argument is set and which regard contrasting epistemologies and ontologies as incompatible should be addressed. Specifically, Haraway's (1991) notion of 'situated knowledge' is introduced, which argues that reconceptualisation of CBPM as 'material-semiotic' enables the analyst to be engaged in the subject and object of rhetorical construction and allows a more comprehensive evaluation of access to distributive (i.e. questions of employee voice, consultation and involvement with the monitoring process) justice using a wider range of both realist and relativist analytical strategies currently available to organizational scholars.

2.7 Ethics involved in procurement through E-commerce

Now, come to the very topic: ethics involved in procurement through electronic commerce. Traditional approaches to computer ethics regards computers as tools, and focus, therefore, on the ethics of their use (James Moor, 1985). As a result, the emphasis of much of computer ethics is on the obligations and responsibilities humans have to each other when their interactions are mediated- or otherwise affected – by computers. If we regard computers not only as tools but a means for handling information, computer ethics might be understood as the study of the ethics of human-computer interaction. Such an approach would open up the possibility that we have obligations and responsibilities to computers as well as other humans.

Stichler and Hauptmna (1998) asset that the “information age has been widely acclaimed as a great benefit for humanity, the massive global change it is producing brings with

new ethical dilemmas: these ethical dilemmas range from the fair and equitable distribution of resources to the availability and provision of education and training, to a mutual respect and consideration of cultural specificity and values. With an example, they declared that a growing disparity continues to set apart the now all-too-familiar “haves” and the “have-nots”. In agreement, Mosco (1998, p123) details the many Myths Along the Information Highway: “...computer communication is the little more than business as usual. A world of information haves and have-nots will far more likely emerge than a global village or a world of virtual communities.” In other words, while the information society offers an abundance of utility, it is contributing to expansive “digital gap”, discouraging people to interact naturally.

The basic questions on electronic commerce ethics remain regarding how the commodity, sellers and buyers will actually come together in a market that still lacks many essential features necessary for secure commercial transactions. While current debates on electronic commerce issues focus on legal or technological aspects, there are also some ideas to review and highlight the economic aspects of these and other issues; for example, the quality of products selling through Internet. In any market, traditional or electronic, uncertainty regarding the quality of products can lead to the collapse of that market. Although the Internet provides a wide variety of services and is used by millions, there is still a noticeable wide gap between the number of commercial products and services that would easily be digitized and those that are currently offered on the Internet. Some see this as a sign of the reluctance of content owners to participate in the electronic commerce and a signal of a reduction in the overall quality of what is

available on the Internet. For physical products, consumers may prefer to inspect products and actually try out instead of looking at a picture or reading a description. Lacking a proper means to verify quality, commercial opportunities may be limited to a few whose quality consumers already know about or is easy to learn online though online banking and travel services are two examples for which consumers are already familiar with electronic.

Whenever talking about procurement, no one could neglect a main area - public procurement - which counts a large percentage of total procurement through electronic commerce, especially in construction industry conducted by both government and non-profit organizations. Nowadays, more and more public procurement are conducted through electronic commerce. In this era of globalization, governments from developing countries are undertaking profound reforms to reduce their budget deficits and foreign debts. Moreover, the economic footprint of the state has been drastically reduced through increased privatization of state assets. Notwithstanding the reduction of the public debt and the sell-off of public enterprises through privatization the public sector will continue to be the most important sector of many economies simply because it is the largest purchaser of goods, works and services in almost all the countries. Thus is probably the domestic private sector's most important client. Based on the calculation of the World Trade Organization (WTO), excluding defense goods, government expenditures on average amount to between 10 and 15 percent of GDP (Concha, 2000).

The topic of public procurement therefore merits urgent attention to achieve the more

efficient use of resources, better quality purchases, increased budget savings, and provide greater transparency in state acts to make it easier to prevent fraud and corruption.

A good starting point to review the organization of a public procurement system is to analyze the responsibility of entities in relation to expenditure and public management. The topic has two facets: on one side, is the necessary interaction between entities that make purchases and those that supervise accounts and applicable laws and regulations. On the other side is the greater responsibility or accountability to be assigned to entities making purchase.

In China, as well as in Shenzhen, there is no single entity that serves as a focal point responsible for public sector procurement. In general, responsibility for procurement system is dispersed in different ministries and state agencies and performed by multiplicity of actors. This may be more or less serious depending on the political organization of each county. As a result, there is the possibility of inconsistency in the application of the rules governing state procurement, and the risk of duplication or lack of adequate control. Furthermore, if responsibility is fragmented or diluted, there is the risk that governments will not have an integral and strategic vision of procurement. It is because good administration requires the integral management of purchases with respect to their administrative, financial, legal, technological, and management aspects.

In addition, the decentralization processes taking place in China are not always

accompanied by the development of capacities and controls required at the central level, nor do they have correct delegation of responsibilities for procurement. There is therefore no procurement system regulatory centralization and operational decentralization that should be the ultimate objective. There are always supporters of both decentralization and centralization of state functions.

Besides morality problems brought about and existed in public procurement process, corruption stands for another key problems occurred in overall procedure and is becoming a more and more serious problem in developing countries. Of course, China is one of them.

2.8 Issues on copyright:

As in other industries and fields, the issue of copyright is causing tremendous concerns and problems in computerized world. With respect to ethics in electronic commerce, many articles have been focused on copyright issues. For example, Whinston, Choi and Stahl (2003) stated in their book that the unique nature of the Internet brings it into uncharted legal and political territory in regard to a number of different issues, among which, copyright is just one. Because the Internet is not constrained by political boundaries, electronic commerce is not adequately defined by existing laws or regulated by one government entity. For example, as commercial activities in the Internet increase, city and state governments are seeking ways to collect and remit sales taxes on Internet transactions (Business Week 1996). But a 1992 court case (Quill Corp. vs. North Dakota) held that for a state to collect taxes on sales, the vendor must have significant sales

operations-personnel, inventory, showrooms, etc.-within the state. Because many internet operations have highly dispersed personnel, little inventory and no showrooms, at this time it is not clear whether states and local governments have a legal right to collect taxes on their sales.

The same problem is foreseen with tariffs and international trade. The question is whether governments should impose control measures such as permits, requirements and regulations so that they can extend their locus of control over Internet commerce, or should they give special treatment to electronic commerce and look for other venues for tax. Each choice will have a substantially different effect on the future development of electronic commerce.

Although copyright protection is an important legal issue, electronic commerce is doubtlessly connected with product quality. Whinston, Choi and Stahl (2003) gave a more fundamental reason in their book 'The Economics of Electronic Commerce' that helps to explain why products of high quality may not be offered on the internet: uncertainty about product quality stemming from asymmetric information. In order to explain it more simply, an example was given: when consumers do not have adequate information about product quality, their willingness to pay depends on the expected level of quality. For instance, if there is an equal chance of getting a good product worth \$100 or a bad product worth \$50, buyers are willing to pay, on average, \$75. Being an average, consumers break even in the long run by paying \$75 for this product. Put it differently, \$25 benefits by consumers who get a good product even out with \$25 losses by those

who receive a bad product. But ethics remained in internet commerce make it very difficult or maybe impossible for consumers to judge the save of \$25 is equal to the risks brought with it or not.

As good quality products withdraw from the market, this leaves the market with low-quality goods, which is 'lemons'. The so-called lemons problem occurs in most market when it is difficult to know product quality prior to purchase (Akerlof, 1970), which is a prominent aspect of electronic commerce for at least two reasons. The first is that digital promoted products are more than just a digitized version of paper-based products. Instead, digital products incorporate the unique advantages of the electronic medium. Newspapers, for example, are personalized, searchable, and updated instantly. The value and quality of a digitized newspaper cannot be adequately estimated based solely on the experience and practice in paper-based counterparts. Furthermore, when products are highly customized and their contents vary greatly, assessing quality becomes increasingly subjective and personal. Another reason for heightened uncertainty – and increased potential for the lemons problem to arise – is the diversity of producers. Unlike physical products, digital products are produced and sold by virtually anyone on the Internet. Through today's personal homepages and Web servers running on every personal computer, every user will be a potential producer and a potential seller as well. Even for physical products, the worldwide market will provide consumers with a considerably greater number of vendor choices, who may not be as familiar as local sellers. Conventional means to convey product quality, such as reputation and brand name, are less useful in this type of market with a vast array of sellers who may be in the

market only for a short time, relatively small overhead costs to enter the electronic marketplace will certainly lower the barrier to entry and will increase the level of competition and choice, but consumers face many difficulties in selecting reliable, suitable vendors.

The current debate on digital copyrights focuses on the ambiguities in legal definitions and the technical means of control that must be modified to accommodate digital products. For example, since copyright protection is extended only to fixed physical expressions, not to the idea itself, copyright enforcement is linked to the physical forms that are used to express these ideas. Ambiguities such as this have convinced most participants in the debate that the digital medium and the transfer conduit of networked computers necessitate a completely new approach to copyrights and other intellectual property rights. While the problems are well debated, what is still lacking for a solution is the economic arguments as to why and how copyrights should be applied to digital products and to electronic commerce.

From an economics point of view, the new approach is based on market analysis, which evaluates property rights of contents owners as well as the public's interest in protecting certain products. Whether user interfaces should be protected is still being argued. Regardless of the ultimate decision, this situation illustrates that market analysis in a copyright infringement issue involves much more detailed study on specific product characteristics and the market. For digital products (e.g., e-newspaper), copyright schemes based on economic analysis may prove to be more valuable than legal and

technical solutions. Current copyright laws and enforcement methods have evolved in the contest of printing presses – and their offspring such as photocopiers – and the way consumers use printed copies.

2.9 Virtue ethics for computational agents

Alternatively, computer ethics might be understood as a sort of android ethics involving the study of the ethical behavior of computational agents. In this vein, Gips (1995) explored various possibilities for the construction of a moral computer, suggesting that a virtue ethic, rather than a consequentiality of deontological ethic, would be most successful because of the compatibility of connectionist architectures with the training required in an Aristotelian virtue ethic. For ethics in computational agents, Coleman (2001) suggested to organize them under four broad categories: agentic, social, environmental, and moral. In addition, he also argue that by providing a framework for identifying and critiquing assumptions about what a ‘good’ computer is, a study of android arête provides focus and direction to the development of future computational agents.

2.10 Ethical issues of online communication research

There are also papers addressing several ethical issues in online communication research in light of digital ontology as well as the epistemological questions raised by the blurring boundary between fact and theory. Ethical dilemmas of Internet research thus arise from the tension between human and computer interaction (Rafael Capurro and Christoph Pingel, 2002). They also argued that ethics research? in the US follows the utilitarian

tradition, while European researchers are deontological oriented.

Sometimes, peoples say that being human is becoming more and more a matter of being online. We live in a digital environment in the sense that we look at reality within the framework of its possibility of being digital or of its digitability. This ontological or to put it in Thomas Kuhn's terminology, paradigmatic dimension does not just concern the fact that we create digital objects and processes or that we are able to create digital models of non-digital objects and processes but very possibility of a digital casing of the world or a digital ontology (Capurro, 2002).

The concept of ontology is used in Heideggerian sense as related to the human capacity of world construction on the basis of the givenness of our being-in-the-world itself (Capurro, 2002). Heidegger's technical term for this existential givenness is Dasein. The perception of finite openness of our existence allows us to produce not just new things be virtual world: within this virtual world, natural things and processes as well as man-made ones can be understood, discovered and / or invented.

Capurro and Pingel (2002) also pointed out that there is a difference between digital ontology and digital metaphysics. From a metaphysical point of view, the reality is digital and vice versa. To put it in Berkeley's formula: to be, is to be digital or *Esse est computari*. To answer the question of what characteristics that the online existence have, Rafael Capurro and Christoph Pingel argued firstly online existence involves a bodily abstraction which implies abstraction from bodily identity and individuality. Secondly,

online existence also entails abstraction from our situational orientation – an orientation which includes sharing time and space with others. Thirdly, online existence is presence – as well as globally oriented. Given the bodily abstraction of online existence, we can also say that digital being-with-others tends to be ghostly-oriented. These characteristics of online existence thus help sharpen the point: ethical dilemmas of internet research arise from the tension between the proper object of research i.e., online existence and bodily existence. The borderline between these two phenomena is interface communication itself.

2.11 Ethic issues concerning with public procurement / Corruption

As everybody might know, procurement, especially public procurement, causes corruption. Most economic analyses of corruption have addressed the question of how to explain corruption in specific situations (Rose-Ackerman, 1978). One of the few stylized facts about corruption is, however, that the incidence of corruption appears to vary strongly across societies even for comparable activities. Sociologists and political scientist have tried to link the variations in corruption levels to certain stages in the modernization process (Huntington, 1968).

Somehow, the profitability of corruption appears to be related to its established frequency. By abstracting from many of the concrete circumstances of given classes of corrupt acts, we give some reasons why there should be links between the profitability of corruption and its established empirical frequencies by considering both the supply and demand for corrupt acts. The model highlights a few mechanisms that may explain the

stylized fact of varying incidence and suggests a few others.

Kindred attempts have been made in the literature. There are at least three similar papers. Liu (1986) put forward a neat two period model with an overlapping generation structure built into it. Liu's model produces conclusions in a similar spirit, but he only focuses on the supply side. Cadot (1987) considered both supply and demand for corrupt acts in a situation where governmental officials administer a test to grant a permit. The situation is similar to a bilateral monopoly in the sense that each official faces one candidate at a time. A corrupt official asks for a bribe and the candidate can either accept the deal or refuse and denounce the bureaucrat by reporting him to higher-ranking officials. Cadot studies the equilibrium outcomes of this game under different assumptions about the information structure. Furthermore, the bilateral monopoly aspect of Cadot is replaced by an assumption about price taking behavior by both the briber and bribee. Sah (1987) puts forward a complex overlapping generation model of corrupt behavior. Sah believed that by taking a more simplistic dynamic approach it is able to highlight other aspects of corruption. Finally, Akerlof (1980) and Schelling (1978) provided models for different economic situations but with a similar structure to the current study (multiple equilibrium, tipping points and corner solutions).

This research focuses on purely economically motivated corruption and restrict the analysis to public bureaucracies. This does not mean that we believe that politically motivated corruption is unimportant. The analysis of that type of corruption, however, requires another approach than the one outlined below. We assume that some rules are not possible to manipulate. In the model no honest bureaucrats are falsely punished for

corruption, which could easily be the case for example when many politicians are corrupt.

Leff carefully argued (1964) the notion that bribery of officials to secure access to controlled resources results in their more productive use. He visualizes bribery as a process in which entrepreneurs bid against each other in what amounts to a clandestine and imperfect auction. With competition forcing prices up, the favors will tend to be allocated to those who can pay the highest prices. In the long run, the favors will go to the most efficient producers, for they will be able to make the highest bids compatible with remaining in the industry.

It is clear that Leff (1964) regards the creation of auction-like conditions as sufficient for resources to be allocated to the most efficient producers. However, this proposition can be faulted on two grounds.

First, even if we allow for the existence of auction-like conditions, Leff's (1964) conclusion does not follow of necessity. Efficient producers may choose to stay away from the auction because they believe the giving of bribes to be ethically wrong. If such efficient but conscientious producers lose their share of resources (which would be theirs under official regulations) to less efficient producers who use bribes to obtain their shares, the net outcome of bribery could well be worse than the regulated allocation. Secondly, and more importantly, the creation of auction-like conditions presupposes unimpeded information flows about and free entry to this activity, neither of which are

going to be realized in the presence of risks connected with the receiving and giving of bribes. Given that risks of detection are non-negligible, it will be shown that risk hedging by officials will preclude the creation of auction-like conditions for access to controlled resources. Some plausible risk-hedging scenarios and their efficiency outcomes will be considered in the rest of this study.

It has often been argued that in developing countries the use of bribes to circumvent direct interventions will improve the efficiency of bureaucratic decisions. Bribery in such situations is believed to create auction-like conditions for access to controlled resources; with bribes set to clear the 'auction', it is concluded that this must improve the allocation of resources (Ingraham, 2000). It will be shown in the following parts that this argument is not persuasive, since the assumption that bribery created auction-like conditions does not hold. This is mainly because of the need to hedge against the detection costs of bribery. Some research has gone on to examine the economic costs of corruption where officials alter government regulations in order to increase the maximum illicit revenues (MIR) that might accrue to them.

It must be pointed out here that the focus on bribery does not imply that this is the only, even the usual, means of evading government regulations. On the contrary, the patrimonial character of the state in many developing countries would suggest that access to resources controlled by the government is more often a matter of political patronage. Kinship and other personal ties with officials are also useful in providing access to controlled resources. However, these forms of corruption are not examined quite often because their efficiency outcomes cannot be determined a priori.

2.12 Special situation in China

With the application of electronic commerce in procurement procedure, chances of meeting powerful officials who hold power for decision-making are apparently reduced to a great extent. As in developing countries, especially in China, where a large amount of construction projects will be and are constructed for a duration of a couple of decades, people will not lose their ties diluted by procurement through internet with officials at both state and local levels. Corruption shows more frequently its impact and results. Following cases were realized recently which stands only a few percentages within total corruption quantities:

The National Editing Bureau realized a series of numbers recently: from Jan. 2002 till Nov. 2002, RMB 200 billion in state operated projects was found being involved with illegal procedure, which results in total loss of RMB 7.23 billion. First example was Fuzhou Changle Airport with total investment of RMB 3 billion. Due impractical design and many wrong doings during overall procurement, the exact capacity could only reach one third of designed capacity. Many facilities and space remain useless. Since 5 years in operation, accumulated loss amounts to RMB 1.1 billion (Times Wave, 2003).

Use Chuandong Nature Gas project as a case. It was the biggest project equipped with Three Gorges Immigration project initiated by Central State. Total project budget amounts to RMB 3 billion. Started in 1994, stopped in 1997 due to lack of funds, and canceled in 1998, the project has already spent RMB 1.3 billion, no mention another

RMB 450 million debts (Times Wave, 2003).

Another typical case also occurred in Shenzhen, China. Shenzhen Huashu Group intended to import CCD and LCD project. Vice Major of Shenzhen at that time, Mr. Qin Wenjian, and the Vice Director of Shenzhen Economic Committee insisted to cooperate with TCI, USA, which was owned by a overseas Chinese couple who had been told of the expectations from the Shenzhen side. After being financed with the necessary budget, Mr. Qin made the contract signed very quickly. Total value amounts to USD 6.26 million, but actual value evaluated by experts only amounts to USD 0.5-0.8 million. The equipment had never been put into operation due to its low quality and bad performance, which has been stored in warehouse since then. The total loss was transferred to State financial side (Times Wave, 2003).

According to the above numbers and cases, corruption occurred in procurement procedure could cause even bigger disasters to both state and organizations.

2.13 Technologies applied in construction procurement

There are numbers of technologies and techniques that are now being used in an unethical manner in support of electronic commerce. Among which, cookies, commercial emails and deception are main issues.

2.13.1 Cookies

Cookies are items of information generated by a Web server and stored in the user's

computer and are ready for future access. Cookies are embedded in the HTML. Such information flows back and forth between the user's computer and the servers. Cookies are implemented to allow user-side customization of Web information. For example, cookies are used to personalized Web search engines to allow users to participate in WWW contests, and to store shopping lists of items a user has selected while browsing through a virtual shopping mall.

However, not all cookies are equal in terms of functionality. At first glance, the impact of cookies information access may be seen as rather limited. Once the user exists in the browser, cookies acquired during the session are deleted. In addition, cookies, by default, can only be accessed by the Web server and the Web page that stored the cookie in the first place (Mayer-schnberger 1996). Thus the accuracy and the transitory nature of personal information cookies are ensured.

Cookies are based on a two-stage process (Mayer-Schnberger 1996). First the cookie is stored in the user's computer without their consent or knowledge. For example, with customizable Web search engines like My Yahoo!, a user selects categories of interest from the Web page. The Web server then created a specific cookie. Through the user browsing over the Web page, a cookie is transmitted to the user's computer. The user's Web browser, receives that cookie and stores it in a special file called a cookie list. This happens without any notification or user consent. As a result, personal information (in this case the user's category preferences) is formatted by the Web server and transmitted and saved by the user's computer.

During the second stage, the cookie is clandestinely and automatically transferred from the user's machine to a Web server. Whenever a user directs her Web browser to display a certain Web page from the server, the browser transmits personal information to the Web server.

This second stage is the main area of concern. The use of cookies becomes commonplace. The browser will accept cookies unless the default settings have been changed. The reason why the use of cookies is becoming so widespread is that they can provide information. This information can be sold or used to determine user profiles.

A series of tests showed that cookie was able to tell which industries the authors were at, the browser the authors were using, and the operating system that they were using. The cookie was saved on the authors' hard disc via the university's firewall.

2.13.2 E-mail address

If a user was using an Internet Service Provider, an on-line business could try to determine who the users were with an interest in their product, or just try to send a blind email to all the users of that Internet Service provider with the aim of reaching that individual user who visited their site.

Email addresses now have a financial value and they are being sold as a commodity. Some dot-com failures are resorting to selling information their customers may have thought would remain under lock and key as they scramble to find assets that can be sold

to appease creditors. At least three companies (Sandoval, 2000) that have recently failed, Boo.com, Toysmart and CraftShop.com, have either sold or are trying to sell highly sought-after customer data that could include information such as phone and credit card numbers, home addresses, and even statistics on shopping habits. When money becomes an issue of survival, some businesses will do anything they can in order to survive.

2.13.3 Web spoofing

Electronic commerce relies on the integrity of its data stored in digital format. Woolford (1999) emphasizes the criticality of authenticity and data integrity. The effectiveness of electronic data is determined by the security associated with its systems. Transaction and stored data must have high integrity. Electronic systems form the whole in the contemporary organization. Its internal data like transport, accounting transaction, and client details are often transferred on open networks. Data for external consumptions such as marketing materials as well as transaction interfaces are also accessible via the Internet. This makes them vulnerable to attack from anywhere (Hutchinson and Warren, 2000).

A common example of electronic deception relates to the Internet and is known as Web spoofing. This is where an attacker sets up a fake web site to lure users in hopes of stealing their credit card numbers or other information. One hacker group set up a site called WWW.MICROSOFT.COM, using the number zero in place of the letter O, which many users might type by mistake. Users might find themselves in a situation that they do not notice they are using a bogus web-site and give their credit card details, etc.

The advent of the Internet has expanded the amount of data available but has also decreased the reliability of much of it. As Ulfelder (1997) says, there are no editors or safeguards to ensure that net information is fair or factual. It is, in fact, a good medium for propaganda. Because nobody is small on the Web (Rapaport, 1997) opportunities exist for getting viewpoints across from many. A single person with a grudge against an organization can weave a damaging image by setting information into a specific context. Of course, organizations can do likewise.

As deception is a conscious activity, it can be assumed that it requires some form of motive. Ford (1996) gives some insight into the types of lies and their associated motive. Whilst his analysis is related to individuals, the classification can profitably be used with the organization. Table I summarizes Ford's findings.

Table 2.1 shows an organization's motives to lie - both to protect itself, and to compromise an enemy or competitor. Organizational deceptions can be used to promote its image (the conventional public relations function), to discredit its competitors (the conventional public relations function), to discredit its competitors (an activity rarely admitted), or to gain advantage by other methods. This is of particular importance within the area of electronic commerce.

Table 2.1: Types of lies

Types of lies

ies

ign and salutary lies
Hysterical lies
Defensive lies
Compensatory lies
Malicious lies
Gossip
Implies lies
Love intoxication lies
Pathological lies

The act of lying is rarely admitted in organizations. The distinction between lying and such activities as advertising is also blurred. Perhaps the more neutral phrase perception management provides a vehicle to carry out meaningful dialogue in this area. In competitive organizational environments, it has always been a potential strategy to deceive competitors, regulators, clients, and even suppliers. But the virtual environment in which electronic commerce is based becomes the ideal environment in which to deceive e.g. you could be dealing with Microsoft or an individual based in Columbia.

Deception techniques can be used to influence clients, the public, government agencies, and competitors. It can be used by criminals to commit fraud. It is the information management function's responsibility not only to ensure the integrity of information and

data, but also to guarantee that information is collected and used to the best advantage of the organization. In this information age, the pervasive nature of digitized data provides ample opportunities for deceivers to apply their skills. All of these issues can be directly related to electronic commerce.

On the other hand, organizations need to be reflect on the benefits of using deception themselves if they want to use it. Whilst the word deception is not often used in the context of advertising or public relations because of its negative nature, this is really what these functions are. Advertising is not just informative. It is designed to change perceptions.

2.14 Summary and Conclusions

Through the literature review, many issues related to ethics, computer ethics, construction procurement process and electronic commerce are discussed. Through the literature review, the concept of ethics has been clearly identified. In addition, through exploring various issues that are related to ethics, procurement or e-commerce, detrimental effects of unethical behaviors to the construction procurement process have been discussed and clarified. Moreover, IT tools that are potentially useful in combating ethical problems have also been investigated. All these are helpful in identifying the boundary and scope of this study.

It is noticeable that although the concept of ethics and its importance have been extensively discussed in existing literature, there has been very little empirical evidence

on patterns of ethical behaviors. In particular, no information has been identified in ethical behaviors in the area of construction procurement using e-commerce systems. Without such empirical evidence, it is difficult to devise preventive measures to improve the ethical standard of the construction industry. Given that it is a open secret that unethical behaviors are ubiquitous in the construction industry in China, and so far little empirical evidence has been gathered to form a pattern of ethical behaviors, this research intends, through various methodologies, to establish such a pattern of ethical behaviors.

Specifically, this study explores unethical behaviors in e-commerce enabled construction procurement processes. Through a questionnaire survey and subsequent interviews and a case study, it is expected that a pattern of ethical behaviors, causes and preventive actions for unethical behaviors can be identified.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The primary research methodologies of this study include questionnaire and interviews.

Survey invitation letters were first sent to 57 professionals enrolled into the MBA programmes offered by The Hong Kong Polytechnic University. Among the 57 professionals to whom the invitations were sent, 30 people accepted our invitation, and participated in this survey. Among these 30 participants, 5 of them working on IT companies, 5 others working mainly as suppliers in the construction field, 10 of them from main contractors, 5 from government construction authorities, and the final 5 being managers in construction companies. In other words, among the 30 participants, 5 of them were IT professionals and 25 construction professional. In addition, 8 of them have more than 10 years of working experience in the construction industry, and 19 have more than 5 years of experience, and 3 have more than 2 years of experience. As the 30 participants were from different parts of China, it is expected that they represented a balanced composition of construction professionals in China.

A pilot test was first undertaken via 5 of the total sample of 30 selected for this study in order to ensure that every question was stated appropriately that respondents could clearly understand the concepts and questions. The pilot questionnaire is listed in Appendix 1. Improvements were made based on the respondents' comments at the end of this consultation process. Specifically, the participants suggested to delete option "e:

Negative effect on career perspective” from multiple choices of Question 9 of Part 1, and they also suggested to delete option “c: Report to police” from multiple choices of Question 10 of Part 1. The reasons given were these options were redundant. These suggestions were accepted in the final version of the questionnaire.

The final version of the questionnaire (see appendix 2) was distributed to 30 participants. For ensuring immediate responses, questionnaires were offered to professionals who are working in the construction industry. Altogether 30 questionnaires were distributed and collected.

3.2.2 Interviews

As for interviews, 8 participants were targeted and interviewed. 2 of them were from IT companies, 2 from construction suppliers, 2 from main contractors in construction industries, and the remaining 2 being managers in construction companies. The interviews were conducted in four nights during October 2004, at the Training Centre of Motorola, Beijing. To ensure the consistency, the interview questions were identical to the ones in the questionnaire survey.

Please see Appendix 3 for those questions.

The major problem or limitation in the analysis performed for this study is the degree of concern that the interviewees has for the ethical issues. For example, if there was little self-adoption or knowledge of the code, there would be little stress emitted. Little stress

led to little evaluation. When applied to law enforcement and dishonest, the responses were generally stronger due to the legal obligation. In non-legal environment, the strength of attitudes, behavior and even ethical feelings do not carry a heavy emotional weight. For a stress analysis to be successful, the respondent must have an emotional tie to the subject. Fortunately, successful participants in the construction industry both understand and embrace the concepts of the ethical behavior. Therefore, the sample provided a relevant basis for stress evaluation.

Persons in charge of the construction procurement are, to some extent, independent, self-decisive individuals working under a strict code of guidelines established by the top management. After the starting period for a new practice, they have to make decisions by themselves on when, where, and from whom to buy the necessary equipment and materials. Except for the most flagrant of misbehaviors, there are few checks or limitations that enforce the rules of behavior. Therefore, it is extremely valuable to find firstly their thinking and doing, and then to work out proper solution to improve the whole procedure.

3.2.3 Case study

For making this research more persuasive, a case study was also presented. A detailed explanation and analysis for the case are given in Chapter 4.

CHAPTER 4: DATA COLLECTION AND ANALYSIS

The questionnaires were distributed and completed by all the 30 people when they were attending MBA classes offered by the Hong Kong Polytechnic University during August 2004 in Beijing. Details of the questionnaire results are illustrated in Appendix 4.

As a follow-up step of the study, interviews were conducted with 8 participants randomly selected from the initial sample of 30 people chosen for the questionnaire survey. Results of the interviews were presented in subsequent sections of this chapter.

In order to get an insightful understanding of ethical behaviors in construction procurement, a case study on the First Virtual Holding was conducted and detailed analysis of its payment system revealed some useful findings related to ethical behaviors in the construction industry.

4.1 Results from questionnaire (Part I)

The questionnaire consists of three parts. Part 1 had twelve questions involving common ethical issues within the organization. In part 2, 11 sensitive questions were asked, which involved personal ethical criteria. If it is realized very soon that the results are completely untruthful, researchers then use this part as the basis for interviews. Part 3 concerns with ethical issues caused by technical defection. Results are analyzed in 4.2.

In the following section, key questions and their responses are analyzed:

Question 4: How do you think of the degree of ethical atmosphere within the organization? Four different degrees were offered as follows:

- a. none,
- b. very little,
- c. social,
- d. very much.

According to the data collected, 7% of the respondents chose “a”, 50% choosing “b”, 40% choosing “c” and last 3% choosing “d” (see figure 4.1).

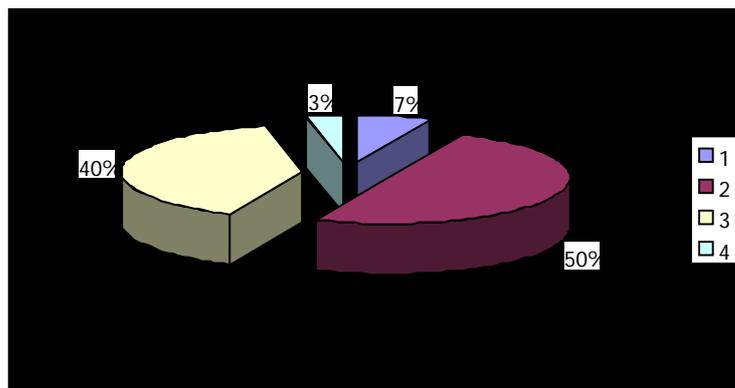


Figure 4.1 Degree of ethical atmosphere within organization

If the responses are separated between the 5 IT professional and 25 construction professionals, the similarities/differences of responses are listed in Table 4.1. In Table 4.1, the percentage represents the ratio of responses within the group, and the number in bracket is the actual number of responses.

Table 4.1 Separation of responses from IT and construction professionals on Question 4.

	a) None	b) Very little	c) Social	d) Very much
IT professionals	0 (0)	100% (5)	0 (0)	0 (0)
Construction Professionals	8% (2)	40% (10)	48% (12)	4% (1)

Interestingly, it can be seen that the 5 IT professionals were consistent in selecting option b, while construction professionals have divided their views among option b and c.

Question 5: What level of ethical awareness do the employees in your company have?

- a) None
- b) A little
- c) Average
- d) Strong

Of all respondents, 3% (only one person) chose “a”, indicating that no ethical factors were mentioned in the organizational culture; 78% (24 respondents) chose “b”, indicating only a few words for ethical factors; 19% (only 6 respondents) believed that ethical factors were existent as the main part of their organizational culture. Finally, nobody chose “d”, which means no organization embedded excessive ethical codes in the company culture (see Figure 4.2 ethical factors in organizational culture).

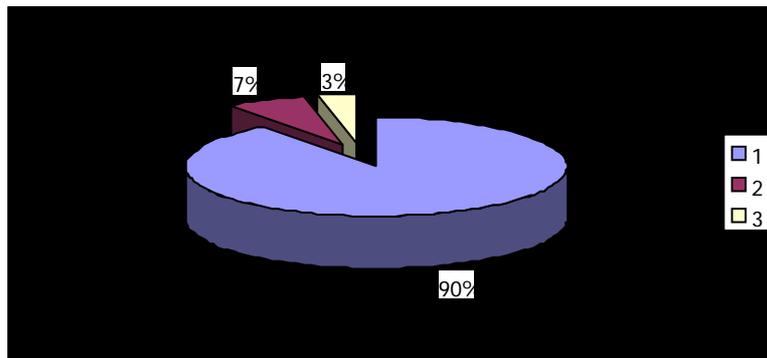


Figure 4.2 Ethical factors in organizational culture:

Table 4.2 shows the differences of responses between IT and construction professionals on Question 5.

Table 4.2 Separation of responses from IT and construction professionals on Question 5.

	a) None	b) A little	c) Average	d) Strong
IT professionals	0 (0)	100% (5)	0 (0)	0 (0)
Construction Professionals	4% (1)	72% (18)	24% (6)	0 (0)

Again, IT professionals were consistent as they all chose option b, while construction professionals had disparate views although 72% of them selected option b.

Question 6: Do you think there is a positive relationship between ethical behavior and long-term profitability of your company?

- a) None
- b) A little

- c) Not obvious
- d) Strongly related
- e) Critically related
- f) Unknown

Only 3% (one person) believed that there was no effect at all on organization’s long-term profits when adhering to ethic codes; 13% (4 respondents) chose “b” and another 13% chose “d”; 20% (6 respondents) chose “c” with the idea of adhering to ethical codes having a positive effect on organization’s long-term profit; but most of the participants (15 respondents; 51%) chose “e”, indicating that they have no idea about it. Please see Figure 4.3 for the result.

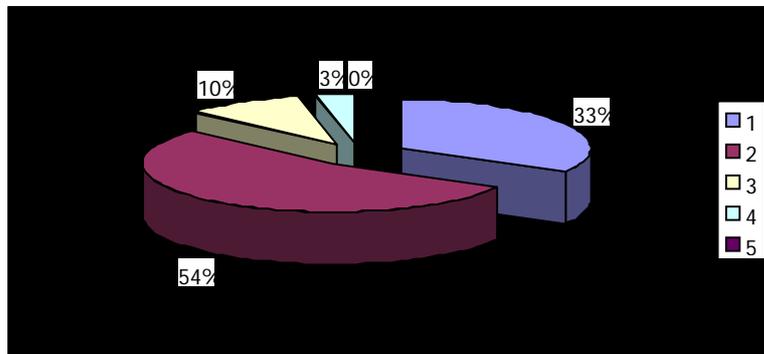


Figure: 4.3 Positive effect on organization’s long-term profit by adhering to ethical codes:

Table 4.3 shows the differences of responses between IT and construction professionals on Question 6.

Table 4.3 Separation of responses from IT and construction professionals on Question 6.

	a) None	b) A little	c) Not obvious	d) Strongly related	e) Critically related	f) unknown
IT professionals	0 (0)	0 (0)	0 (0)	0 (0)	100% (5)	0 (0)
Construction Professionals	4% (1)	16% (4)	24% (6)	16% (4)	40% (10)	0 (0)

Again, IT professionals were consistent as they all chose option e, while construction professionals had disparate views although 40% of them selected option e.

Question 7: Do you think there is a positive relationship between ethical behavior and short-term profitability of your company?

- a) None
- b) A little
- c) Not obvious
- d) Strongly related
- e) Critically related
- f) Unknown

According to the findings, nobody believed that there was no effect on organizational short-term profit when adhering to ethical codes. In other words, every respondent agreed that unethical behavior had effects on organization's short-term profit. 10% (3 respondents) believed that unethical behavior had a little effect; 47% chose answer "c", while 43% went for "d". In general, people agreed that unethical behavior had great

effects on organization's profit at least for short term (see Figure 4.4: unethical behavior affecting organization's short term profit).

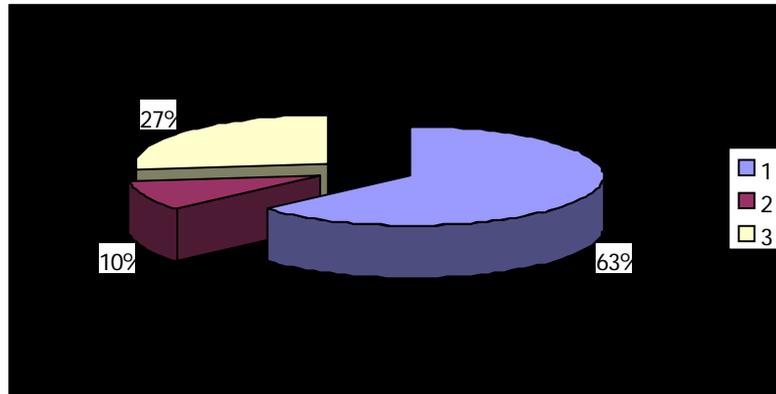


Figure:4.4 Unethical behavior affecting organization's short-term profit

Table 4.4 shows the differences of responses between IT and construction professionals on Question 7.

Table 4.4 Separation of responses from IT and construction professionals on Question 7.

	a) None	b) little	A	c) obvious	Not	d) Strongly related	e) Critically related	f) unknown
IT professionals	0 (0)	20% (1)		80% (4)		0 (0)	0 (0)	0 (0)
Construction Professionals	0 (0)	8% (2)		40% (10)		52% (13)	0 (0)	0 (0)

From Table 4.4, it is noted that 4 out of 5 IT professionals chose option e, and one

selected option b. For the construction group, 52% of them selected option d and 40% selected option c. Again, the IT group demonstrated a strong consistency.

Question 8: Has ethics been openly discussed within your company?

- a) No
- b) Seldom
- c) Often
- d) within groups
- e) privately

Of all respondents, 63% admitted that ethical problems had never been discussed openly within the organization; 10% believed that it had been discussed occasionally, while nobody agreed that ethical was discussed quite often. 7% agree that they discussed ethical issues within small groups and another 20% admitted that they had mentioned the issues quite often privately. Please see Figure 4.5 for investigated results:

Figure 4.5 Ethical issues discussed within organization

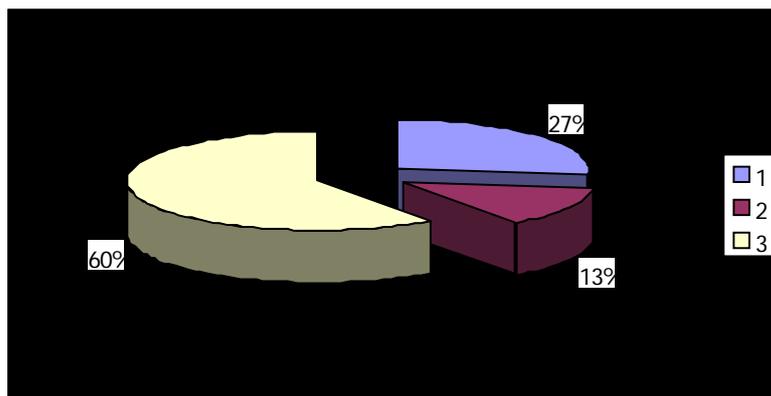


Table 4.5 shows the differences of responses between IT and construction professionals on Question 8.

Table 4.5 Separation of responses from IT and construction professionals on Question 8.

	a) No	b) Seldom	c) Often	d) Within group	e) Privately
IT professionals	100% (5)	0 (0)	0 (0)	0 (0)	0 (0)
Construction Professionals	56% (14)	12% (3)	0 (0)	8% (2)	24% (6)

Again, IT professionals demonstrated a strong consistency as they all selected option a,. For the construction group, 56% of them selected option a and the rest selected among options b, d and e.

Question 9: What are the difficulties for developing a strong ethical awareness in your company?

- a) Lack of support from senior management
- b) Prevailing trend within the industry
- c) Negative effect on short-term profit
- d) Negative effect on personal relationship

Respondents chose more than one answer prepared for this question, and it is very difficult for them to go for one or two while giving up the others. In another word, every reason counts when considering treats to establishing positive ethical atmosphere. The answers participants chose are leaders haven't set examples themselves, unethical

atmosphere within whole industry, ethical behavior would reduce organization's short-term profit, ethical behavior would put organization at loss, ethical behavior would affect individual's profit and future promotion, etc.

Table 4.6 shows the differences of responses between IT and construction professionals on Question 9.

Table 4.6 Separation of responses from IT and construction professionals on Question 9.

	a) Lack of ...	b) Prevailing ...	c) ...short-term profit	d) ...personal relationship
IT professionals	100% (5)	100% (5)	40% (2)	40% (2)
Construction Professionals	72% (18)	92% (23)	68% (17)	28% (7)

From Table 4.6, it can be seen that in responding to this question, both IT and construction professionals selected multiple options. While all IT professionals attributed options a and b to the difficulties in developing a strong ethical awareness, views from the construction professionals were unevenly distributed among all options.

Question 10: What will you do find you spot unethical behaviors?

- a) Keep silent
- b) Try to correct it

- c) Report to senior management
- d) Report to judiciary bodies

Unexpectedly, 90% chose “a”, indicating that they would keep silent and let it be, for answers “b”, “c”, and “d”, each of these answers received 10% votes. Refer to Figure 4.6 for the results:

Figure 4.6 Actions taking against unethical activities:

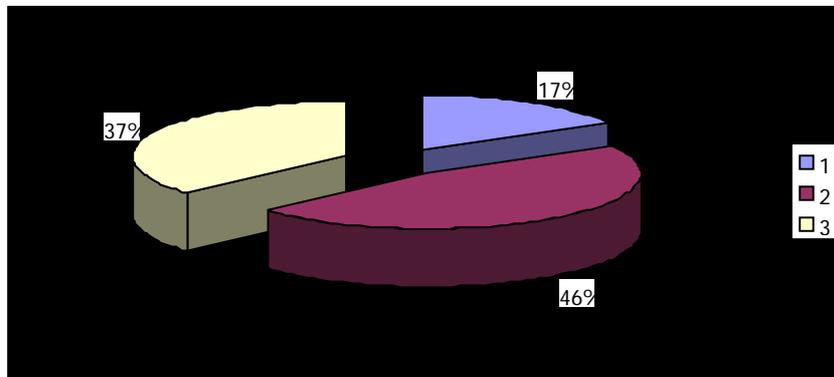


Table 4.7 shows the differences of responses between IT and construction professionals on Question 10.

Table 4.7 Separation of responses from IT and construction professionals on Question 10.

	a) Keep silent	b) Try to correct it	c) Report to senior mangt	d) Report to judiciary bodies

IT professionals	100% (5)	0 (0)	0 (0)	0 (0)
Construction Professionals	88% (22)	4% (1)	4% (1)	4% (1)

From Table 4.7, it can be seen that while all IT professionals selected option a and only 88% of construction professionals selected option a. Again, IT professionals demonstrated a higher level of consistency.

Question 11: Will unethical behaviors increase the cost of procurement?

- a) Yes
- b) No
- c) No Idea

Question 12: If the above answer is 'yes', what do you think is the increased rate?

- a) 5%
- b) 10%
- c) 15%
- d) 20%
- e) 30%

Only three answers were offered, which were "YES", "NO" and "NO IDEA". Expectedly, most of the respondents (90%) definitely answered "YES", only one respondent chose "NO", another two answered "NO IDEA". Refer to Figure 4.7 for the results.

When answering the degrees of cost increased by unethical behavior, as the scale of 5%,

10%, 15%, 20%, 30% were used. 33% gave their votes to 5%, while 54% went for “b”.

Nobody believed it would be increased by 30%. See Figure 4.8 for the results.

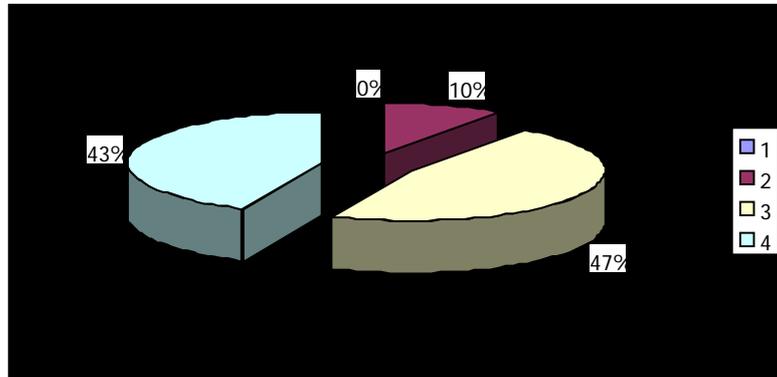


Figure 4.7: Unethical behavior increases the procurement cost:

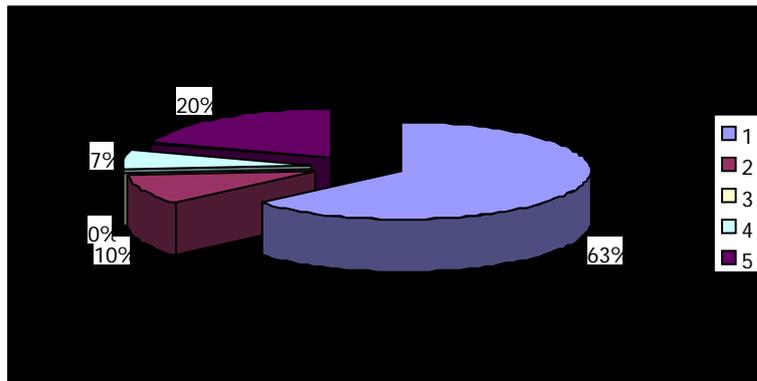


Figure 4.8 Percentage increased on cost by unethical behavior:

Table 4.8 shows the differences of responses between IT and construction professionals on Question 11.

Table 4.8 Separation of responses from IT and construction professionals on Question 11.

	a) Yes	b) No	c) No Idea
IT professionals	80% (4)	0 (0)	20% (1)
Construction Professionals	92% (23)	4% (1)	4% (1)

From Table 4.8, it can be seen that majority of both IT professionals (80%) and construction professionals (92%) believed that unethical behaviors increased the cost of procurement.

Table 4.9 Separation of responses from IT and construction professionals on Question 12.

	a) 5%	b) 10%	c) 15%	d) 20%	e) 30%
IT professionals	60% (3)	20% (1)	0 (0)	0 (0)	0 (0)
Construction Professionals	24% (6)	52% (13)	12% (3)	0 (0)	0 (0)

From Table 4.9, it can be seen that although both groups believed that unethical behaviors increase the cost of procurement, the IT professionals expected 5% of increase while 52% of construction professionals expected 19% of increase.

4.2 Results from interviews

The very nature of this study creates some basic analysis problems. The participants of construction procurement were arranged for an interview one by one. A number of questions including the ethical code questions were asked and recorded. Later, the responses were analyzed. Because of the special nature of the process, it was not possible to re-interview the interviewees. The results must be considered as a means of evaluating the acceptance of the ethical code. Furthermore, when attempting to explain the possible causes of stress, some factors might be missed. These omissions, however, should not affect the importance of the interviewee's reaction to specific ethical code items.

There was a wide array of responses. Although questions were based upon specific legal and ethical guidelines or problems related to the issue, there were only a few questions to which everyone responded uniformly. The diverse pattern of answers indicates free responses from interviewees. It does not appear that the interviewees felt compelled to provide the sociably acceptable answer. In addition, the relaxed and friendly atmosphere created by the interviewer helps a lot in getting personal answers to those sensitive questions.

The first five questions are the most sensitive on aspects of following or breaking rules or laws. The design of this study offers little possibility of measuring the level of concern overlaid across behavior. Interviewees were questioned with respect to their

observance of laws, moral standard and generally accepted industry rules of behavior. Interviewees reported their actions, and the total answers were compared to the stress indicators (see table 4.1).

Table 4.1: Answers with stress indicators

	Stressed response	No stress	Total
Follow rules	17%	63%	75%
Break rules	2%	23%	25%

Although the interviewees indicated in 75 percent of the answers that they follow the rules; almost 25 percent of these responses displayed stress. Of those interviewees who stated that they did not follow the rules or guidelines, only 8 percent of those indicated signs of stress. One might surmise that those who do what they want (do not follow the rules) may be more at ease than those who follow or at least claim to follow specified guidelines.

Pragmatically, it is useful to evaluate the specific responses from a stress perspective. In this analysis, response questions that indicated no stress must be taken at face value. For example, approximately half of the interviewees would take listings at inflated values and about half would not. Even though there may be some feelings relative to this type of unethical behavior, those that would do it had no compunction. Technically, if a interviewee felt the behavior was wrong and proceeded anyway, stress patterns would be evident.

With respect to question 6, participants were asked about their attitudes or attitudes of their leaders towards unethical behaviors, and actions they and their leaders took while attracted by profit brought about with unethical activities. An evaluation of the stressed questions provides insight into the interaction of feeling and behavior by the participants dealing daily with construction procurement either with or without electronic commerce.

It may not be of serious consequence that the participants in this study followed or violated the law or the ethical guidelines. What is of consequence is in the code itself. The professional ethical code is basically designed to be a “compliance code”. A code such as this includes detailed rules to govern professional conduct. If following the rules causes personal grief or if breaking the rules does not draw management’s attentions, problems are present. This is the reason why there are so many economic crimes and corruption. In this study, 40% of the interviewees who claimed to follow the ethical code give questionable or stressed responses, which indicates, to a certain extent, rules were broken during daily dealings. This implies that these individuals either actually broke the code or were uncomfortable with it.

Simultaneously, only 8% of those that admitted violating code exhibited stress. It is the responsibility of those who construct codes of ethics to ensure acceptance of the covenant of the code. It is not enough to set the rules, laws or codes and expect everyone to follow blindly.

This study reveals a problem that transcends all ethical codes. It is not enough for a set of rules to be designed and then thrust upon a group of working individuals. If there are guides in an ethical code that are not being accepted, yet are important concepts to be adhered to, then, these ideas must be promoted. If values of ethical constructs are not readily visible, then their values and benefits need to be promoted to the users of the code. Ethical codes are for the good of the individuals and the company.

4.3 Results from questionnaire (Part III): Technological factors affecting ethical issues in construction procurement through e-commerce

In this section, the responses for the technological factors are analyzed as follows.

Question 1: Are commodities used in construction easy to describe?

- a) Yes
- b) No
- c) No Idea

Three answers were offered as “NO”, “YES” and “NO IDEA”. Among the interviewees, 63% of them chose “NO”, 10% chose “YES” and 27% have no idea on it. Results are indicated in Figure 4.9.

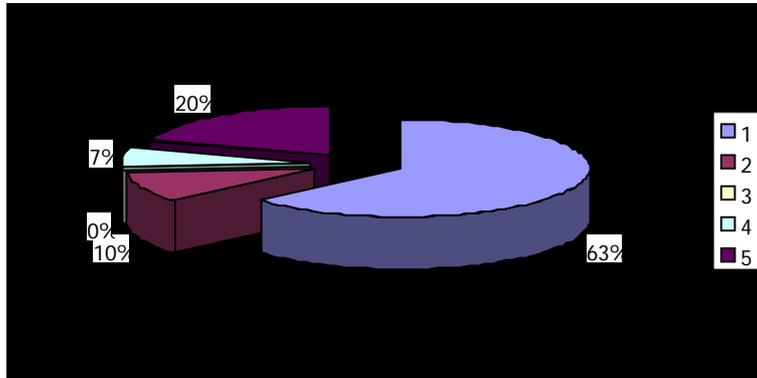


Figure: 4.9 Can construction products be easily described by Internet

Question 2: What technical deficiencies can cause unethical incidents?

- a) Electronic payment system
- b) Cookies
- c) Web spoofing
- d) Cheating
- e) Network suppliers

According to the results chosen by participants, each reason had counts. Most of the interviewees selected all those five answers indicating electronic commerce in construction procurement has not been well established. It is noted that many problems including those not listed here existed in the process, which prohibits and holds down at the meanwhile, the development and full application by stakeholders in the industry.

Question 3: Which party is not untrustworthy in the e-commerce procurement chain?

- a) Buyer
- b) Supplier

c) Middle Agent

27% of the participants believed that the buyer was the untrustworthy party, while 13% didn't trust the supplier, and 60% put their suspension on middle agent. Figure 4.10 shows the results.

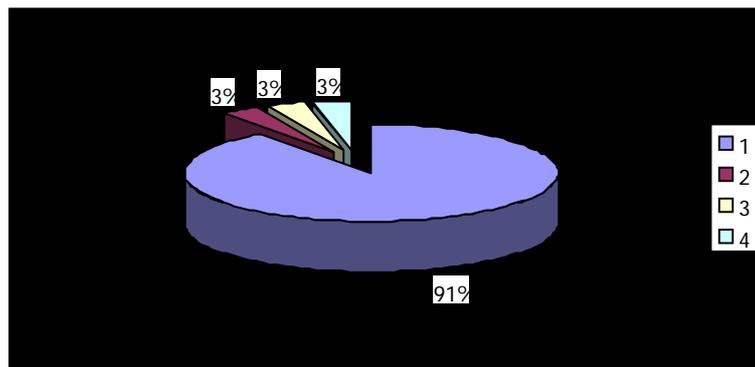


Figure 4.10. Untrustworthy parties in e-commerce procurement chain:

Question 4: Is it possible to establish a model, by which unethical factors could be completely dismissed in construction procurement?

- a) Possible
- b) Possible, but takes a long time
- c) Impossible

Unexpectedly, 37% of the interviewees chose “c”, which means no possibilities at all. 46% of the interviewees offered their confidence on the possibility but expressed it would take a long time. Only 17% believed it was possible. Figure 4.11 shows the results.

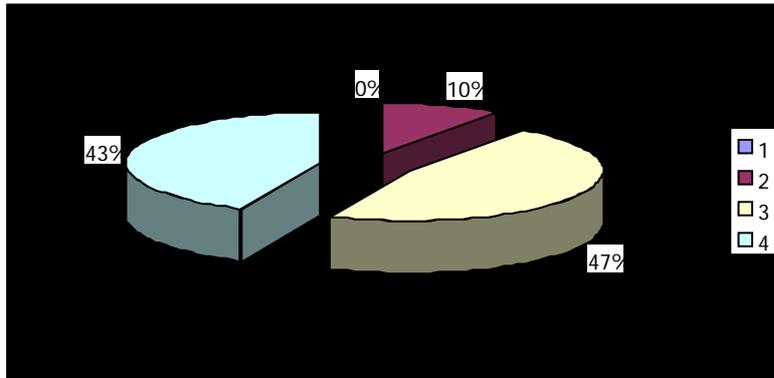


Figure 4.11 Possibility of establishing models to dismiss unethical behavior

4.4 Suggestions offered by interviewees

As the final part, interviewees offered many suggestions, which were summarized as the following items:

- The leadership with an organization should set strict guidelines on ethical code and behavior, and encourage the whole organization including themselves follow and stick to the rules;
- To define a mission of keeping ethical code and make it clear to everybody involved;
- It is encouraged to discuss freely ethical issues within organization;
- To build a right atmosphere within organization to encourage ethical behavior;
- By training or education, the concept of ethics could be further strengthened and improved;
- Outside of organization, it is suggested to establish a kind of association to make uniform rules and regulation so that each organization within the industry would follow and adhere to it.

- To avoid and limit unethical doings through technology innovation;
- Proper and effective laws against unethical doings in procurement behavior should be established as soon as possible.
- The government should function as the main factor to interdict any unethical concept and behavior in the construction industry.

4.5 Case of First Virtual Holding-Payment system

First Virtual Holdings was formed in early 1994. The first product offering from First Virtual was an Internet payment system, which was developed, announced as a fully operational open Internet service on Oct. 15, 1994.

First Virtual's system differs in many ways from other systems, most notably in the fact that it does not rely on encryption or any other form of cryptography to ensure the safety of its commercial transactions. Instead, safety is ensured by enforcement of a dichotomy between non-sensitive information (which may travel over the Internet) and sensitive information (which never does), and by a buyer feedback mechanism built atop existing protocols.

In a nutshell, the First Virtual's payment system is built on top of preexisting Internet Protocols, notably the SMTP/RFC822/MIME (email), telnet, finger, ftp, and http protocols. Because these protocols are insecure in the sense that they carry no strong proofs of identity, it is necessary to design a payment system in such a way as to provide

much stronger protection. While others have focused on achieving this goal using cryptography, First Virtual designed a higher-level protocol based on email callbacks.

In the First Virtual system, a buyer and a seller may use any procedure of protocol to meet the transact business. While this often occurs when a buyer browses a seller's Web page, it also frequently happens by emails, ftp, or Internet Relay Chat, or even off-net entirely. Moreover, it could easily happen in the future via protocols that do not exist today. Once the buyer and the seller have an intention to do business, they submit a transaction to First Virtual. That transaction can be submitted via standard email or via a new protocol called the Simple MIME exchange Protocol (SMXP), designed by the company for real-time exchange of MIME objects.

When First Virtual processes a financial transaction, it looks up the buyer's Virtual personal identification number (PIN) in its database and finds the buyer's email address of record. An email message is dispatched, asking the buyer to confirm the validity of the transaction and his or her commitment to pay, which the buyer can respond to with a simple answer of "yes," "no," or "fraud." Only when the buyer says "yes", a real-world financial transaction is actually initiated. Simple attacks based on Internet sniffing are rendered Unappealing because their value is sharply limited by the fact that a Virtual PIN is not useful off the net and requires email confirmation for use on the net. More sophisticated attacks require criminals to break into the victim's computer account and monitor the victim's incoming mail. A crime that is much easier to trace. It is also worth noting that such a break-in would probably yield access to the victim's encryption keys

in any commerce schemes that make use of public-key cryptography for encryption.

In the First Virtual's system, the valuable financial tokens that underlie commerce – notably credit card numbers and bank account information – never appear on the Internet at all. Instead, they are linked to the buyer's Virtual PIN when the customer applies for a First Virtual account – a procedure that involves an off-Internet step for the most sensitive information. Currently, the sensitive information is provided by either an automated telephone call (for buyers to provide their credit card number) or by postal mail (for sellers to provide their bank account information). However, it would also be possible to provide the Virtual PINs automatically to buyers an message, such as by direct mailing from the credit card issuers, as is done with traditional ATM PINs.

The exclusion of the most valuable (to criminals) information from the Internet data stream eliminates any need for encryption, which in turn eliminates the need for any nonstandard software on the buyer's end. Ordinary email, which effectively represents the lowest common denominator of Internet connectivity, is all that anyone needs in order to participate. The simplicity of this approach gained First Virtual more than a year's head start in the marketplace lowered the entry barrier to anyone wishing to become a user.

Another unusual feature of the First Virtual system is that it is explicitly designed for entrepreneurs. There is no screening process for sellers, allowing anyone on the Internet to open a new business. The system even includes an automated information server – the

InfoHause – that will (for an additional fee) make information continuously available for sale via the Web, ftp, an email, even for sellers who do not have their own Internet server.

CHAPTER 5: CONCLUSIONS AND DISCUSSIONS

This study explored ethical issues related to e-commerce enabled construction procurement process. Specifically, a thorough literature review has revealed an abundance of studies related to ethics, privacy, e-commerce and construction procurement process. However, little information was available on ethical behaviors in e-commerce enabled construction procurement process. For this reason, this study investigated various unethical problems related to the construction industry in general, and to the procurement process in particular, in order to identify reasons and possible solutions. Through a questionnaire survey, interviews and a case study, an overall understanding of unethical behaviors in e-commerce enabled construction procurement process was obtained.

Specifically, through the questionnaire and interviews, it was identified that the majority of the respondents (70%) agreed that ethical atmosphere is almost nonexistent in the China construction industry. The majority (78%) also agreed that there was only a little ethical awareness. However, the majority of respondents (51%) believed that there is a positive relationship between ethical behavior and long-term profitability of the company. On the other hand, the respondents' views were divided when judging the relationship between ethical behavior and short-term profitability as 40% believed the relationship between ethical behavior and short-term profitability of the company was uncritical, while 43% believed there was a strong relationship between them. The majority of respondents (63%) also confirmed that ethics was never discussed with

companies. When asked on the difficulties encountered in developing a strong ethical awareness in the company, respondents cited various reasons including the lack of support from senior management; prevailing trend in the industry, negative impact on long-term and short-term profitability. The majority of respondents (90%) also chose “keep silent” when asked if they spotted unethical behaviors. Finally, the majority of respondents (90%) believed that unethical behaviors increase the cost of procurement by at least 10%.

If the respondents were separated into IT professionals (5 in total) and construction professionals (25 in total), it was identified that IT professionals were much more consistent in their views and responses, while construction professionals had disparate views in their responses. This could be due to the fact that construction professionals were drawn from main contractors, governmental departments and clients. Because of their different roles during the construction procurement process, their views could vary slightly.

5.1 Contributions of this study

Contributions of this study can be summarized into the following aspects:

- Identification and establishment of a profile for unethical behaviors: Statistical analysis of questionnaire survey and interviews enabled us to obtain a profile of ethical problems and behaviors in the construction industry in China. Although this study focuses on the procurement process with the application of electronic

commerce system, it is not unreasonable to assume that the problems and behaviors prevail within the whole project delivery process.

- Identification of causes of unethical behaviors: subsequent interviews and case study enabled us to identify possible causes of unethical problems in the construction industry; and;
- Proposition of measures for preventing unethical behaviors: With the understanding of the ethical problems and possible causes, it is possible for us to propose preventive measures to curb unethical behaviors. These are further elaborated as follow.

5.2 Possible models for dismissing unethical behaviors

According to the findings, participants believed that it was possible to build up a model, which could dismiss unethical behavior in construction procurement process. The purpose of establishing a practice model is to dismiss as much as possible the unethical behavior in construction procurement process.

Similar to business models in other industries, the construction procurement model has two basic mechanisms for consideration: the flow of materials or services through two steps in the value chain – markets and hierarchies. Williamson (1981) categorized market transactions as those that support coordination between buyers and sellers, and

hierarchy transactions as those that support coordination within the firm as well as the industry's value chain. Williamson (1981) pointed out that the choice of transaction will depend on a number of factors, including asset specificity, the parties' interest in the transaction, and ambiguity and uncertainty in precisely describing the transaction.

The analysis of transactions gives a framework for examining the potential changes in organizational and the industry's value chain. Chandler (1979) noted, "every coordinative activity that improves organizational efficiency, speeds up flow through the system, or permits a more intensive use of the factors of production is likely to improve the performance of the economic system." Williamson (1981, p1554) also pointed out that "the modern corporation is to be understood as the product of a series of organizational innovations that have had the purpose and effect of economizing on transaction costs."

What has been said about the cooperation seems equally applicable to the industry's value chain, where Michael Porter (1990), who used the term "value system" for increasingly a function of how well a company can manage this entire system. If it is true that the national information infrastructure will dramatically reduce the costs of information and communication (i.e., coordination costs), a fundamental restructure of entrepreneurial opportunities and roles within the industry's value chain will result. Within a given value chain, each business will search for transactions that will provide advantage over its competitors and competitive differentiation to explore the potentiality of the information infrastructure. For example, one or more of the organizations within

an industry's value chain may be bypassed when the information infrastructure provides the links for a new pattern of transactions. Networking technologies can greatly reduce the costs entailed in exchange transactions. As these costs decline, many business activities previously carried out within vertically integrated firms will be shifted to the marketplace. The network will, in many instances, serve as the market. When this occurs, market structure will depend as much on network characteristics and the economies of networks as it does on relationships among firms (Benjamin and Wigand, 1995).

The price a product is sold for consists of three elements: production costs, coordination costs, and profit margin. Different scholars use different terms to describe coordination costs: Chandler (1979) described them as administrative costs, while Williamson (1981) referred to them as governance or transaction costs. This research uses Malone et al.'s (1987) description of production and coordination costs. Production costs include physical or other primary processes necessary to create and distribute the goods or services being produced, while coordination costs include the transaction (or governance) costs of all the information processing necessary to coordinate the work of people and machines that perform the primary processes. For example, coordination costs include determining the design, price, quantity, delivery schedule, and similar factors for products transferred between adjacent steps on a value chain.

Firms choose transactions that economize on coordination cost Malone et al.'s (1987). As information technology continues its rapid cost performance improvement, the unit cost of coordination transactions will approach zero, thus enabling the design of

innovative coordination transactions to fit new business needs.

The information infrastructure presents an idealized model of (point-to-point connection?), at an extremely high bandwidth and at relatively low user costs. The conceptual model supports a feasible scenario of what will happen to organizations and the industry's value-added chain (i.e., the collection of companies involved in producing, distributing, and selling a related sets of products and raw materials to consumers), when the information infrastructure becomes real.

By dismissing unethical behavior, procurement costs could be reduced. While establishing a practical and efficient model, potentially substantial savings in transaction costs and significant price reductions for consumers could be achieved. Since much electronic commerce requires transportation of both physical goods and information, the model has to connect to the parties or be connected by the means as stated below:

- Producers of information, including computer software;
- Producers of physical goods, including all construction materials and manufactured goods;
- Purchasers;
- Electronic markets, expended by market maker;
- Physical distribution networks, simplified to move from the manufactures to the consumers directly;
- Electronic channels;

By establishing the right model, five areas of opportunities could be achieved:

- Benefits to the consumers. The consumers will have free market access to all suppliers and are willing to pay an interconnection cost.
- Lower coordination costs throughout the industry procurement process.
- Lower physical distribution costs. Delivery cost will be minimized in two ways: first, information will be transmitted electronically, and much lower electronic distribution costs will be substituted. Second, as each element of the industry procurement process is bypassed, a physical distribution link and related inventory carrying costs will be eliminated :
- Redistribution and potential reduction in total profits.
- By eliminating unethical behavior, around 5-10% of total cost could be saved based on investigation results.

5.3 Establishment of ethical atmosphere in E-commerce procurement process in the construction industry

Based on the research results, it is firmly believed that building up a right atmosphere for ethical procurement within the industry is highly important and efficient. To implement this mission, several suggestions are summed up on the basis of information collected.

5.3.1 Defining a mission

Vital elements in any organization are the purpose and mission, which describe how the people of the business act and make decisions, or at least how they say they do these things. According to Dr. Pastin (1986), “Purpose gives a company a sense of what it is, where its goals come from and why trying hard matters.” Purpose and mission statements may be thought of as one, as long as the mission statement covers all the interests served by the organization.

Thomas Horton, president and chief executive officer of the American Management Association, wrote that “the best mission statement is a concise description of what business the company is in or what business it realistically wants to be in and how it serves its customers’ needs.” He specifically recommended evaluating management’s ethics and the corporate values on which employee behavior is based. By so doing, many other stakeholders’ interests are brought into the mission.

If all managers and employees are responsible for the organization’s purpose, they can no longer excuse for marginal ethical conduct. There should be an alignment of individuals and organizational ethics. Business ethics also can be linked to other themes and priorities in the organization, such as quality, safety and customer services. However, piggybacking ethics on another program can be risky, especially if the other program is in trouble and its credibility has been questioned. For example, Total Quality Management is a statistically and fundamentally sound program, but its effectiveness can be sharply curtailed in a company in which trust and ethics are given low priority.

Another potential threat to the success of an ethics program is the lack of follow-through in employee training. Sometimes, organizations provide managers with ethics awareness training and then expect them to train all their employees without adequate professional support. This approach frequently fails because supervisors often are responsible for others forms of training (such as technical standards, quality, safety, etc.) and because many managers and supervisors are not effective presenters of training sessions on “soft issues.” Outside involvement in a company-wide training program can be expensive, but the lack of follow-through can be even more costly in terms of the overall effectiveness of an ethics awareness program.

Important themes such as candor, true commitment to quality and customers service and increased sensitivity in performance evaluation are often integrated into a well-designed ethics awareness training program. All these issues can be linked under an overall business ethics theme. It ties the otherwise competing priorities together and makes them coherent and manageable.

5.3.2 Building right atmosphere within procurement range

Inevitably, personal ethics and values dominate most business activities. Without a foundation for trust or an understanding of behaviors, business would degenerate and the business customer as well as inter-business relationships would suffer. If enough individuals in a society agree, laws are developed to protect the various parties involved in business transactions. Essentially, the law describes boundaries of acceptable behavior. In spite of many opinions to the contrary, the law can only limit behavior by

certain degrees. Unless there are massive enforcement measures, consistent challenge to rules and laws creates an environment of decay. This, in turn, destroys a culture's ability to develop a consensus on matters of right and wrong. (Adelman, 1991) The result is ethical schizophrenia – many ethical faces (Cheavening, 1986).

To combat this possible dilemma, organizations and businesses derive codes of conduct or codes of ethics for their membership. These codes of ethics take behavioral practices out of the personal realm and provide individuals a basis for establishing boundaries of “proper” behavior. In our culture even this innocuous act faces resistance. The researchers tend to have a culture bias against accepting universal moral norms. People have little patience with tradition; relativism, pluralism and individualism are very strong. Cavanagh (1998, p15) summarized out cultural notion of general ethical guidelines as: “My values must be my values and they are as good as anyone else's”.

In order to establish positive atmosphere for ethical doings in construction procurement, hard and long-term work are recalled. There is a famous economic law called inferior currency drives out fine currency, which was a summary on traditional phenomena. Without suitable environment, the fine currency could be expelled by inferior currency. In order to avoid this tradition phenomena in the modern society, people, at least most people in the industry, should have uniform or common idea towards what is right or wrong in the process of procurement.

5.4 Suggestions to reduce corruption

The most direct outcome the unethical doing leads to is corruption. According to the findings, a member of an organization acts in a corrupt way if he directly or indirectly deals with a non-member and uses the organization's resources including his decision making power and special information to acquire payment that is against the rules of the organization or against the law.

A member of the public is committed to a corrupt act if he tries to bribe a bureaucrat. The suppliers of corrupt services are those bureaucrats who choose to take bribes as payments for illegal services. The period length is so short that a member of the bureaucracy and a member of the public can at most transact one corrupt service per period. Corrupt services are assumed to be homogeneous such that the number of corrupt bureaucrats can indicate the level of corrupt transactions. Furthermore, all potential bribers demand the same amount of corruption.

Today, many developing countries are more or less forced to cut public spending as a cure for balance-of-payments-problems. If this also implies that real wages of civil servants are cut more than those in private sectors, one should expect increasing incidence of corruption at least in countries without serious political corruption. A higher willingness to take bribes may involve serious problems since foreign trade regulations at the same time are likely to increase the demand for corrupt acts in connection with the allocation of import and foreign exchange licenses. As mentioned, however, things may be quite different in thoroughly corrupt societies with high corruption also at higher-ranking political levels. In countries with much political

corruption, a cut in public spending may in fact reduce the overall levels of corruption.

5.5 Suggestions on Public procurement

Like in most of the developing countries, corruption in public procurement is usually unavoidable. With respect to public procurement, ethical issue should be addressed in terms of increasing the economy and efficiency of those processes. The best way to operate should be analyzed on a case-by-case basis. Although a decentralized operation may be more efficient in a given context, there are circumstances in which lower costs are obtained by means of centralization of some purchases, whether by economies of scale or through the specialization of certain entities.

Improving traditional procurement practices will only be possible if the persons responsible for these matters in the public sector promote a transparent commercial environment. Doors must be open to all bidders where the prime motivation is efficiency and economy in procurement in order to acquire goods and services that satisfy needs at a just price.

Training in better procurement practice and rules is one of the fundamental methods for achieving such a change. This is a necessary and very profitable investment since the new procurement techniques, which will include advertising and purchasing through electronic means using available opportunities, will only lead to greater efficiency and cost reduction if public sector officials are trained to use them adequately.

On the other hand, the best mechanism for preventing practices that conflict with the principle of probity in bidding is to make tender processes very transparent so that every citizen may know what they are. In fact, the use of the Internet will revolutionize the way in which the typical procurement process is carried out. All current technological development trends seem to indicate that in the near future Chinese cities, including Shenzhen will have the opportunity to develop government procurement systems that will function in the international electronic market with all its associated benefits.

In the context of the modernization of public administration, probity acquires a broader sense than the mere struggle against corruption. It is related to the significance of public responsibility, professionalism, the obligation to be accountable for resource use, and to place collective interest above individual interest. Prevention should be the policy adopted by the government to guard against corruption and all those unethical behaviors.

It is now common to refer to the technological revolution, that is, the inclusion of the Internet into all functions and activities of both persons and institutions. Some may even say that it is not a question of a new technology but rather a new era (Floridi, 1999). The public procurement information system is oriented toward a significant transformation of the way in which procurement is managed in the public sector by using currently available technologies to transform the process. The government should set an objective

to prevent corruption and to make procurement management in the various State procuring units as effective as possible in order to improve the speed, efficiency, resource saving, transparency and quality of procurement processes. Through this system, public institutions will publicize on the Internet their calls for bids and quotation requirements for all their purchases of both goods and services with the conditions and terms of reference usually associated with these invitations. In addition, the results of a procurement process will include, indicating who approved the purchase, the corresponding price, and the predominant criterion (technical or economic) in its selection. Likewise, the system will provide other complementary functions such as processes to search for potential registered suppliers, registered public institutions, and acquisition.

Searches may be made using various criteria that were previously selected. The system also provides a list of reports of all procurement published and approved by the system in the time periods it sets both in aggregate form for the entire system as well as by individual institutions. The latter is particularly useful for budget planning of each institution.

5.6 Limitation of the research

The topic is comparatively new to the construction industry in China, especially in

Shenzhen, where economy falls far behind the east and coastal areas. Though it is believed and agreed that unethical problems in this area are more serious and special than the results showed from investigations. However, it is very difficult to dig every truth out of the earth because people from these areas are more conservative and less civilized. In addition, time and labour force devoted by researchers toward this study is relative short and insufficient. Taking all these into account, the study might not be as comprehensive and sufficient as researchers originally expected, but it does disclose some existing situation and meanwhile, provide a basic frame for professionals in this industry to improve their current practice and for researchers interested in this topic in their future study.

5.7 Recommendations for future research

This research mainly focuses on ethical issues concerned with electronic commerce, technologies, procurement process, reasons behind the phenomena, and general suggestions for future improvement by construction organizations. It is suggested that researchers, in their future study should offer more efforts on the following issues:

- Make or maximize profits through ethical behaviour in both short term and long term periods;
- Improve productivity within organizations and within the industry on aspects of quality of production factors, quality of production processes and quality of products and services while taking consideration of ethical factors;
- Preserve or increase, through ethical methods, the wealth owners/investors; Respect suppliers' ethical concept; Be fair and ethical to competitors; Regard employees, like re-educate and empower employees, etc.; Serve customers

ethically.

In summary, this study has identified ethical problems and possible causes of unethical behaviours in the construction procurement process. Possible preventive measures have been proposed which may help dismiss unethical behaviours in the construction industry.

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Appendix 1: Pilot Questionnaire

This questionnaire aims to investigate ethical issues related to the E-commerce based construction procurement process in China. Specifically, we expect that the questionnaire can firstly identify unethical behaviors that might exist in the procurement process. Then, follow-up interviews may enable us to identify reasons for the existence of these unethical behaviors. Suggestions can then be made for statutory bodies on how to take appropriate measures to prevent unethical behaviors.

Part One: General Information

Q1: What is the nature of your company?

a) State-owned, b) Privately owned, c) Joint venture

Q2: What is the classification of your company?

a) 1st Class, b) 2nd Class, c) 3rd Class

Q3: How many years of working experiences do you have in the construction industry?

a) More than 10 years, b) More than 5 years, c) More than 2 years, d) Less than 2 years

Q4: How do you think of the degree of ethical atmosphere within the organization?

a) None, b) Very little, c) Social, d) Very much

Q5: What level of ethical awareness do the employees in your company have?

a) None, b) A little, c) Average, d) Strong

Q6: Do you think there is a positive relationship between ethical behavior and long-term profitability of your company?

a) None, b) A little, c) Not obvious, d) Strongly related, e) Critically related, f) Unknown

Q7: Do you think there is a positive relationship between ethical behavior and short-term profitability of your company?

a) None, b) A little, c) Not obvious, d) Strongly related, e) Critically related, f) Unknown

Q8: Has ethics been openly discussed within your company?

a) No, b) seldom, c) often, d) within groups, e) privately

Q9: What are the difficulties for developing a strong ethical awareness in your company?

a) Lack of support from senior management, b) Prevailing trend within the industry, c) Negative effect on short-term profit, d) Negative effect on personal relationship, e) Negative effect on career perspective

Q10: What will you do find you spot unethical behaviors?

a) Keep silent, b) try to correct it, c) report to police, d) report to senior management, e) report to judiciary bodies

Q11: Will unethical behaviors increase the cost of procurement?

a) Yes, b) No, c) Unknown

Q12: If the above answer is 'yes', what do you think is the increased rate?

a) 5%, b) 10%, c) 15%, d) 20%, e) 30%

Part 2: Unethical Behaviors in Procurement Process

Q1: Have you encountered any unethical incidents during procurement process?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q2: If you are a supplier, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q3: If you are a supplier, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q4: If you are a main contractor, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q5: If you are a main contractor, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q6: Within the situations described in Q2-Q5, what actions should you or your senior management take if profits for your company are obtained through these unethical methods? ?

a) Nothing, b) Not encouraged, c) Disciplinary action within the organization Yes, but not serious, d) Report to relevant authorities

Q7: With reference to professional ethical code, how should you or your senior management handle the temptation of unethical incidents?

a) Accept it, b) Selectively accept, c) not encourage, but also not refuse, d) strongly decline

Q8: Is there any effect of unethical behavior on the results of procurement process?

a) Has decisive effect, b) Has slight effect, c) Has not effect

Q9: Are you aware of any unethical behavior of the senior management within your company?

a) No, b) Occasionally, c) Frequently, d) Constantly

Q10: What is the attitude of the senior management towards unethical behavior?

a) Nothing is unacceptable if it brings in profits for the company, b) Only investment-return ratio is considered when deciding what to do, c) Not encouraged, d) Never conduct any unethical actions

Q11 Please rate the importance of the following factors in terms of their influence on the results of a procurement process.

a) Quality, b) Price, c) Ethical relationship

Part 3: Technical Aspects Related to Ethics in the Procurement Process

Q1: Are commodities used in construction easy to describe?

a) Yes, b) No, c) No Idea

Q2: What technical deficiencies can cause unethical incidents?

a) electronic payment system, b) Cookies, c) Web spoofing, d) Cheating, e) Network suppliers

Q3: Which party is not untrustworthy in the e-commerce procurement chain?

a) Buyer, b) Supplier, c) Middle agent

Q4: Is it possible to establish a model, by which unethical factors could be completely dismissed in construction procurement?

a) Possible, b) Possible, but takes a long time, c) Impossible

Q5: Do you have any suggestions on how to improve the standard of ethical behavior in an E-commerce based construction procurement process?

Appendix 2: Questionnaire on Ethical Behaviors in E-commerce Based Construction Procurement Process

This questionnaire aims to investigate ethical issues related to the E-commerce based construction procurement process in China. Specifically, we expect that the questionnaire can firstly identify unethical behaviors that might exist in the procurement process. Then, follow-up interviews may enable us to identify reasons for the existence of these unethical behaviors. Suggestions can then be made for statutory bodies on how to take appropriate measures to prevent unethical behaviors.

Part One: General Information

Q1: What is the nature of your company?

a) State-owned, b) Privately owned, c) Joint venture

Q2: What is the classification of your company?

a) 1st Class, b) 2nd Class, c) 3rd Class

Q3: How many years of working experiences do you have in the construction industry?

a) More than 10 years, b) More than 5 years, c) More than 2 years, d) Less than 2 years

Q4: How do you think of the degree of ethical atmosphere within the organization?

a) None, b) Very little, c) Social, d) Very much

Q5: What level of ethical awareness do the employees in your company have?

a) None, b) A little, c) Average, d) Strong

Q6: Do you think there is a positive relationship between ethical behavior and long-term profitability of your company?

a) None, b) A little, c) Not obvious, d) Strongly related, e) Critically related, f) Unknown

Q7: Do you think there is a positive relationship between ethical behavior and short-term profitability of your company?

a) None, b) A little, c) Not obvious, d) Strongly related, e) Critically related, f) Unknown

Q8: Has ethics been openly discussed within your company?

a) No, b) seldom, c) often, d) within groups, e) privately

Q9: What are the difficulties for developing a strong ethical awareness in your company?

a) Lack of support from senior management, b) prevailing trend within the industry, c) Negative effect on short-term profit, d) Negative effect on personal relationship

Q10: What will you do find you spot unethical behaviors?

a) Keep silent, b) try to correct it, c) report to senior management, d) report to judiciary bodies

Q11: Will unethical behaviors increase the cost of procurement?

a) Yes, b) No, c) Unknown

Q12: If the above answer is 'yes', what do you think is the increased rate?

a) 5%, b) 10%, c) 15%, d) 20%, e) 30%

Part 2: Unethical Behaviors in Procurement Process

Q1: Have you encountered any unethical incidents during procurement process?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q2: If you are a supplier, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q3: If you are a supplier, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q4: If you are a main contractor, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q5: If you are a main contractor, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q6: Within the situations described in Q2-Q5, what actions should you or your senior management take if profits for your company are obtained through these unethical methods? ?

a) Nothing, b) Not encouraged, c) Disciplinary action within the organization Yes, but not serious, d) Report to relevant authorities

Q7: With reference to professional ethical code, how should you or your senior management handle the temptation of unethical incidents?

a) Accept it, b) Selectively accept, c) not encourage, but also not refuse, d) strongly decline

Q8: Is there any effect of unethical behavior on the results of procurement process?

a) Has decisive effect, b) Has slight effect, c) Has not effect

Q9: Are you aware of any unethical behavior of the senior management within your company?

a) No, b) Occasionally, c) Frequently, d) Constantly

Q10: What is the attitude of the senior management towards unethical behavior?

a) Nothing is unacceptable if it brings in profits for the company, b) Only investment-return ratio is considered when deciding what to do, c) Not encouraged, d) Never conduct any unethical actions

Q11 Please rate the importance of the following factors in terms of their influence on the results of a procurement process.

a) Quality, b) Price, c) Ethical relationship

Part 3: Technical Aspects Related to Ethics in the Procurement Process

Q1: Are commodities used in construction easy to describe?

a) Yes, b) No, c) No Idea

Q2: What technical deficiencies can cause unethical incidents?

a) electronic payment system, b) Cookies, c) Web spoofing, d) Cheating, e) Network suppliers

Q3: Which party is not untrustworthy in the e-commerce procurement chain?

a) Buyer, b) Supplier, c) Middle agent

Q4: Is it possible to establish a model, by which unethical factors could be completely dismissed in construction procurement?

a) Possible, b) Possible, but takes a long time, c) Impossible

Q5: Do you have any suggestions on how to improve the standard of ethical behavior in an E-commerce based construction procurement process?

Appendix 3: Interview Questions

As a follow-up of the questionnaire survey, a face-to-face interview is carried out on a selected group of respondents. The following are a list of questions asked during the interview.

Q1: Have you encountered any unethical incidents during procurement process?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q2: If you are a supplier, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q3: If you are a supplier, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q4: If you are a main contractor, have you ever used unethical methods to obtain profits for your company?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q5: If you are a main contractor, have you ever used unethical methods to obtain profits for yourself?

a) No, b) Occasionally, c) Frequently, d) Inevitable

Q6: Within the situations described in Q2-Q5, is there is conflict between organizational and personal benefits?

a) No, b) Occasionally, c) Yes, but not serious, d) very serious

Q7: As a statutory department, how should it handle the temptation of unethical incidents?

a) Accept it, b) Selectively accept, c) not encourage, but also not refuse, d) strongly decline

Q8: Is there any effect of unethical behavior on the results of procurement process?

a) Has decisive effect, b) Has slight effect, c) Has not effect

Q9: Are you aware of any unethical behavior of the senior management within your company?

a) No, b) Occasionally, c) Frequently, d) Constantly

Q10: What is the attitude of the senior management towards unethical behavior?

a) Nothing is unacceptable if it brings in profits for the company, b) Only investment-return ratio is considered when deciding what to do, c) Not encouraged, d) Never conduct any unethical actions

Q11 Please rate the importance of the following factors in terms of their influence on the results of a procurement process.

a) Quality, b) Price, c) Ethical relationship