

Being Ethical in Developing Information Systems: An Issue of Methodology or Maturity in Judgement?

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Abstract

This paper constructs and compares two practical approaches toward being ethical in developing information systems. Firstly, it looks into the prevailing practice of relying on rational decision-making procedures to address ethical challenges, then an alternative view on being ethical is scrutinised with the focus on moral virtues and maturity in development of moral judgement. Through a study on real ISD project, it is suggested that the two approaches could somehow complement rather than supplant one another, and the combination of both sorts of consideration represents an effective practical paradigm for assessing ICT workers' ethical activities and performance in developing information systems.

1. Introduction

The necessity of including ethical consideration in Information Systems Development (ISD) has been seriously explored in recent decades, numerous books and journal articles as a result have been produced by both academics and practitioners in Information and Communication Technology (ICT) [4, 22]. This literature, undoubtedly very constructive or even ground breaking for information ethics, has often been conducted from a restricted perspective and thus is short of a comprehensive or practical assessment of their impacts. Confusion or even conflicts in either moral principles or frameworks for their application are inevitably experienced.

This paper takes a critical view on current ethical practices in ISD. It compares two different models that are

of practical significance to ICT workers. One such model is the methodological or procedural approach [12] which seeks to ethically sensitise professional activities in ISD either through clarifying embedded values and principles, or by prescribing procedures or steps for observance. Another contrasting approach, however, places emphasis on the personal moral character of individuals, and the maturity level of ethical judgement in an organisation. Following the study on theoretical and practical features of these two models, a real ISD project in China will be introduced for examination in terms of its ethical sensitivity and system developers' moral considerations, thereby providing practical insights into the application of the suggested models. This paper demonstrates through the case analysis that being ethical in ISD concerns not only the development process and the methodologies, but also, more essentially, the people working on the development project, both as individuals and as a collective. The models for being ethical, as outlined in the paper, can indeed complement rather than supplant one another, and the combination of both considerations represents an effective and practical paradigm for examining or evaluating ICT workers' ethical activities or performance in developing information systems.

2. Methodological Approach towards Ethical Performance in ISD

The term 'Method of Ethics' was initially introduced for considering practical ways toward being ethical. It implies rational procedures by which one can understand or observe "what kind of thing individual human beings ought to – or what it is right for them – to do, or to seek to realise by voluntary means" [20]. During the last two decades, more and more ethicists and computing professionals have focused their attention on the

possibility and viability of applying ethics in the field of ICT through various methods or procedures. Maner [12] for example claimed that the dominant practice in applied ethics is now procedural ethics, which he remarked could “be an especially good fit for computing professionals”. What this procedural or methodological ethics promotes is the idea that an ethical process could somehow bring out ethical outcomes through calculation and deliberation. Along this line of thought, the main tasks for computer ethics are to define and clarify ethical requirements and values in the development, then to specify moral responsibilities for each and every ICT worker involved. In following sections, issues related to these tasks will be briefly scrutinised before we look into practical aspects of the methodological approach.

2.1 Ethical Issues in ISD

Ethical issues and considerations are usually highlighted and addressed because of the mounting public concerns toward various computing activities or the probable social implications of computer-based information systems. We hold the view that ethical issues in computing in general and ISD in particular have been aggravated, altered or extenuated by the malleable and uncontrollable nature of ICT [14]. Partly as a response to address or alleviate such concerns, most of the leading computing professional organisations and companies have spelt out prominent ethical issues they deemed as deserving close attention in ICT application in the form of professional code or code of ethics. Notable efforts are those made by professional bodies like ACM, BCS, IEEE-CS or larger companies such as IBM and Fujitsu.

In addition to work done by leading professional or business organisations, some individuals have also contributed their professional insights to raise the concerns and potential ethical challenges. For example, Bynum [3] grouped certain ethical issues related to processing information under the title of “computer security”, which is a term he used in a logical sense rather than a physical one. For Bynum, “computer security” covers five aspects in processing/using information that should be matters for concern: privacy and confidentiality of data; information integrity; unimpaired service; consistency and controlling access to resources. Probably the most influential category of ethical issues related to ICT/ISD is Mason’s PAPA [13]: privacy, accuracy, property and accessibility. Many of the ethical concerns raised or expressed by various individuals or parties in contemporary literature are essentially evolving around the central themes of PAPA [1, 16].

Those issues being highlighted may not be always of practical significance or helpful for ICT practitioners. Systems of different natures call for or embody varied

ethical concerns according to their respective application domain, thus many particular emphasises or worries need to be clarified as well. However, sceptics may point out the potential adverse effects of explicitly specifying ethical issues in ISD. Though a list of moral issues involved or embedded in ISD could be enlarged/adjusted under particular circumstances, it would be extremely difficult, if possible at all, for the list to be exhaustive. For example, a good attempt was made by Bologna [2] but with the advances in ICT since the list was compiled, it is now obviously quite incomplete. Thus the completeness of a list can be problematic and any attempted listing on issues of ethical concern in ISD should indicate explicitly its limitations. Otherwise, as Fairweather [9] contended, an incomplete list could potentially divert away the attention from some other equally important ethical issues in systems development. Therefore, any effort in listing or explicating moral issues in ISD should be modest and heuristic rather than algorithmic.

2.2 Moral Responsibilities of Systems Development Professionals.

“Responsibility” could generally be defined or understood as having two senses, one is in terms of the causal sense and the other is the sense of accountability. In discussing the responsibilities of ISD workers, Weckert and Adeney [26] suggested that the “second and stronger sense is the central one” (p.90), and ICT workers are, or ought to be, accountable for their actions in their professional fields. Though they are quite sceptical to call ICT people professionals, emphasis is nevertheless placed on the development of a professional attitude amongst ICT workers. Weckert and Adeney hold that ICT practitioners “should have a professional attitude toward their work, and have special responsibilities beyond those had by all humans” (p25).

In contrast to such an attitude of treating ICT workers as a special occupation, and thereby calling for particular occupational ethics, Edgar [8] claims that “Professional ethics in the computing area, as in other areas, is basically a set of ethical guidelines that should apply to any human being who has dealings with other human beings – fairness, honesty, honouring of contracts, not to cause harm, and respect for life, property, and privacy of others – plus a few specifics that arise from the role of the professional in society”. She continues with the argument that “professional ethics would seem to reduce to good common sense plus a few directives specific to the computer specialists’ role in society”. Nonetheless, she maintains that in situations of developing information systems, ICT people have “additional obligations to the public to make those systems as safe and reliable as

possible, with built-in human controls if the automatic systems should fail.” (p336)

Computer professionals have a variety of relationships with other people that entail different responsibilities. Bynum [3] remarks that such relationships include at least four facets: employer to employee; client to professional; professional to professional and professional to society. Among these relationships, the last one indicates clearly that computing professionals as individuals should shoulder certain moral responsibilities and conduct their professional duties honestly for the benefit of the whole of society.

2.3 Procedural Ethics in ISD

A remarkable phenomenon in ISD is the wide application and adaptation of certain ISD methodologies that are claimed to be effective and productive in delivering the expected outcomes. Ethical considerations related to, or embedded in, system development activities or performances have been differently treated by various methodologies. Nevertheless, such ISD methodologies, whether or not they themselves address ethical concerns directly, seem to have shared a common assumption that ethical problems in ISD, like the systems under construction, could be effectively and efficiently addressed through appropriate procedures. The argument is that if correct methodologies can build good systems, then appropriate methodologies could also help to promote ethical development process and deliver ethical outcomes.

- Ethical ISD Methodologies.

Within the literature on information systems development, certain methodologies are claimed to be ethical approaches. ISD methodologies such as Soft System Methodology (SSM), and Effective Technical and Human Implementation of Computer-based System (ETHICS) attempt to involve as many as practically possible systems development considerations that are deemed as of significance to the success of the system. Issues that should be taken into account in ISD are mostly those associated with system initiation, technical design and implementation, daily operation and maintenance. SSM presumes that developing systems with a holistic view is more or less an ethical way [5], therefore SSM can claim to have developed systems ethically and for ethical ends with its prescriptions on rich pictures and root definitions in requirement specification. ETHICS argues that ethical system development should take all sorts of scio-technical factors into consideration, with participation and realisation of job satisfaction being the essential routes towards being ethical in ISD [15].

The expansion on the factors of consideration put forward by methodologies as such inevitably enlarges the scope of concern for systems developers who are usually expected to do their job efficiently, effectively and ethically, thus making them somewhat impractical in the views of some ICT practitioners. Furthermore, those methodologies are also accused of being weak in providing effective means for addressing concrete moral problems in the development process [11]. As a result, soft approaches like SSM are often dismissed as not being a substantial ISD approach and only useful as a good “front end”.

- Ethical Procedures in ISD

Exponents of other ISD methodologies such as Information Engineering and the Structured Systems Analysis and Design Methodology (SSADM), are quite sceptical about the effectiveness and workability of the “soft” ethical methodologies. They also recognise the drawbacks of those hard approaches in terms of their limited considerations on sociological or ethical aspects of ISD. Efforts have been made to retain the technological sharpness of those methodologies and meanwhile to remedy the limited accounts of value factors on development activities through well-elaborated decision making procedures, thereby achieving ethical sensitivity within such methodologies. In other words, certain ICT researchers and practitioners are seeking possible ways to ethically sensitise system development activities as prescribed by the methodology in phases where necessary and appropriate.

Contributions to this approach have been made from both ICT practitioners and academic ethicists. One good example is Rogerson et al’s work on SSADM [19], in which they try to project relevant clauses from the code of ethics of the Australian Computer Society onto each phase of a “hard” system development approach like SSADM. A great number of frameworks for ethical decision-making have already been suggested and tested in different circumstances to help to clarify, specify and verify ethical principles and duties, as illustrated in a well-organised taxonomy edited by Maner [12]. There are even ethical decision making software tools specially designed to enable system developers to work out their ethical performance and development activities, irrespective of the methodologies they are using or favour. SoDIS, developed by Gotterbarn and Rogerson [10] seeks to empower system analysts to have a comprehensive ethical picture about the system under consideration, both for themselves and for others. The Ethos System™ was commercially developed to provide a framework for ethical decision-making [23] in developing business systems.

3. Moral Character and Maturity in Judgement

3.1 Philosophical assumptions

An alternative ethical approach, supported by the Aristotelian perspective and Rawls's "Reflective Equilibrium" [18], is quite sceptical about the methodological approach's philosophical presuppositions. Instead, this approach pays attention to specific contextual features and individual's moral character during the course of action. It stresses the interaction between moral agent's own intuition or judgement and established moral principles within a given situation. All procedures or steps, principles or prescriptions are just there to enable systems developers to contemplate and act on development issues. But capability does not necessarily imply willingness to behave ethically, as the latter could only be driven by strong personal moral sensitivity or moral virtues. Aristotelian ethics believes that moral virtues can only be developed as a habit in a particular context. Moral sensitivity, as viewed by this alternative approach, is cultivated in an appropriate environment and results from cumulative efforts like positive organisational development and uprightness in personal life, rather than being achieved through following rational procedures or some algorithms.

This alternative model places attention on agent's moral character and maturity in making judgements, either as an individual or as an institution. Excellence in individual moral character lies in practising virtues personally and in self-reflection. Maturity in ethical judgement in an institutional settings, however, is determined by varied factors, the ideas supporting the acclaimed Capability Maturity Model (CMM) in software engineering could offer illuminations in this respect and we will come to it later in section 3.3.

3.2 Reflective equilibrium and moral character

The idea of "Reflective Equilibrium" (RE), promoted by Rawls [18] and articulated in the field of ICT by writers like Van den Hoven [25], rejects the applicability claimed by the quasi-algorithmic decision-making procedures within the methodological model in terms of its impact on ethical activities in ISD. Instead, it argues for discussion on justification of ethical judgement. There is a trend in philosophical circles towards "practical" moral reasoning in the last two decades. Such a trend in philosophical thinking, when compounded with more and more explicit demands for being "reflective" from the ICT

professionals, makes RE a practical model for contemplation about how to be ethical in developing information systems [24]. This reflective model tries to achieve a desirable "state of mind" which shows a mutual adjustment between moral judgement considered at a particular moment and the principles prescribed. The coherence between personal moral judgement in a specific situation and the moral principles and rules in a general sense is both the product and the means for serious ethical contemplation.

It is also suggested [7] that for ethical principles or rules to be effective and viable, they could not be held rigidly or absolutely as in the methodological model. For a model of excellence in moral judgement, no ethical principle or rule is immune from revision as against the personal judgement and background theory. The RE incorporates "both contextualised moral perceptions and general principles" and therefore articulates a coherent approach in which "there are only relations of interconnectedness, suitably interpreted" [24]. It is explicitly indicated in the RE that of all the solutions to the problem of moral justification in the field of ICT/IS, "moral judgement and the intuitive balancing of the priorities" must be introduced in the end [24].

Personal moral judgement or choices in a group or community are to be drawn out of the agent's moral character in the view of Aristotelian ethicists. With such an Aristotelian perspective, emphasis is placed on the process of moral practice or judgement rather than on finding the solution for ethical dilemmas, when attempting to address ethical challenges in ISD. It was through practising and acting that the moral agent's capability or confidence in moral judgement increases, hence moral character is developed and matured. However, Aristotelian ethics claims that no moral actions exist without reasoning or a moral character state. This implies that any moral choice is determined by the character or the rational principle. The methodological approach has illustrated the importance and impact of reasoning, the alternative approach shows that the emphasis on moral character, or contemplation on the moral virtues, is also necessary for achieving an ethical "state of mind" in ISD.

3.3 Maturity in Ethical Judgement

Any reflective equilibrium in moral judgement is conducted within a given context. The "direction of fit" between ethical judgement and principles is determined by that context in which "technology, facts, practices, social relations and human experience are intertwined" and is "best characterised as a 'mangle of practice'" [25]. We have indicated that individual ethical reflection is conducted out of one's moral character and aided necessarily by rational thinking procedures. Moral

judgement within or by an organisation, however, demonstrates rather different features with respect to its evolution. Judgement could be differently reached at various stages of this evolutionary process in an organisation. Maturity in such moral judgement, or the developmental feature of the judgement thus deserves close attention when we contemplate on ethical performances in ISD by ICT people and organisations.

The Capability Maturity Models (CMM) developed by the Software Engineering Institute (SEI) in the USA [17] for evaluating or enhancing capability in software development processes can offer a useful conceptual framework here, in terms of the consideration of ethical judgement in an organisation. The CMM assumes that the quality of an outcome depends on the quality of the process used to produce it in a given setting. It can be used to assess the capability of an organisation either for its software development (SW-CMM), or people-related practices (P-CMM) [21]. The CMM champions five maturity levels that lay successive foundations for continuous improvement. Each maturity level is a well-defined evolutionary plateau and has institutionalised a level of capability for development within the organisation. These five levels describe an evolutionary improvement path from an ad hoc, inconsistently performed process to a mature and disciplined one. Though moral judgement in an organisation does not quite fit into such a capability model, the conceptual framework of CMM would somehow offer guidance for understanding, reconstructing the development and improvement of moral judgement activities, particularly in terms of its evolutionary character. As in ISD, the problem that computing professionals most often are confronted with is the difficulty or awkwardness of sorting out ethical judgement in different institutions, or even at different times within the same organisation. It would be much more helpful and productive for the ICT people to have in mind the notion of maturity levels in moral judgement, and accordingly make appropriate moral choices, than following faithfully those ethical decision-making procedures, or being driven relentlessly by his or her personal moral convictions. The following case examination from China will indicate the necessity and workability of including the notion of maturity in moral judgement in an organisation, when attempting to achieve ethical ISD.

4. An Oriental Case: ethical considerations in developing a population information management system in China

4.1 Context

For reasons that include economic concerns, China is now one of the few countries in the world that impose residential controls upon its citizens. Residents in China, either permanent or temporary, must register with the police any changes with their residential conditions, particularly for those who move from rural areas into cities. The scenario of developing an urban population information system for policing in China could offer a unique perspective for examining and evaluating ethical activities and performance in ISD. In this case, we study on an Urban Population Information Management System (UPIMS) developed by local police in Dalian, Northeast China, with respect to its attitudes toward embedded values and ethical challenges. The aim is to provide an illustration of the application of the suggested models to promote ethical sensitivity in ISD in a given context. It does not intend to support or refute any allegation on particular police activity or strategy in a political or legal way, as the co-authors of this paper take differing views on such matters.

Dalian City is a coastal port with around 1.7 million populations. It has witnessed a rapid increase in its population in the last two decades because of its unique geographic location and economic development potentiality. Development on the UPIMS was started in 1996 [6]. The system is designed mainly for managing the “mechanistic increase” in urban population (which refers to the inward migration under the regulation of the city government). The UPIMS in Dalian on the one hand allows the local authority to have an updated demographic picture of the city at any time, and accordingly make policies, and help the police in deploying and managing relevant policing resources. On the other hand, it enables residents to have a better understanding of their respective situation when they are dealing with the system, and allow them to have quick access to, or be kept informed of, the results.

4.2 Stakeholders and moral issues in UPIMS development.

From the very outset, some liberal minded people might dismiss the whole project of UPIMS development as unethical and claim that it is meaningless to talk of morality thereafter. This attitude would preclude it from being used for examining and evaluating ethical performance or activities in different cultural contexts. In China where the government always assumes a paternal role and controls nearly everything important, social and ethical issues raised by a system like UPIMS and the development activities will naturally catch the attention of the governing body. Indeed, it is in the government’s

interests and obligation as well to look into every aspect of their activities in Confucian perspective that prevails in Chinese society.

Prominent ethical issues involved in UPIMS development have been identified, highlighted and well elaborated by the project commissioning body (in this case, the Dalian Police), and local government, through their circulars or newsbulletins, which serve literally as codes of conduct for system developers. It is either explicitly indicated or implicitly inferred within such project circulars that there are many stakeholders whose interests should be guarded in UPIMS development. Though the relative weight attached to the stakeholders specified could differ in the eyes of the government, the commissioning police organisation, and the system developers, there are nevertheless agreements between them as to who the stakeholders are and what obligations owed to them respectively. Amongst important stakeholders in UPIMS development, the local government stands out demanding accurate data on overall demographic picture in the city and the efficiency of the information service. Dalian Police have a stake in UPIMS development in the sense that they rely on proper functioning of the system to make social assessments, plan operations and manage resources. Of course, individual urban residents are the people who have the greater stake in the UPIMS as it is directly linked with their residential status and generates serious impacts on their daily life. Other stakeholders in UPIMS development include various business enterprises, public organisations, families and local police constables as well, although many system developers may have different perceptions about the extent of their stakes in the project.

As agents in developing such a politically and morally sensitive system, ICT professions from the Dalian police are required to contemplate on their moral responsibilities to those stakeholders specified or implied in directives or circulars. The following are categories of ethical issues that UPIMS developers are encouraged to pay attention to.

- Comprehensiveness and accuracy of the data

UPIMS is designed primarily to enable the government to keep in good control of population movement for the sake of maintaining urban life quality. Information generated by the system would be used for making decisions on policies that are of significance to a great number of households and organisations. Therefore, a genuine picture of the demographic situation is very important and ultimately is determined by the correctness, comprehensiveness and accuracy of the data collected and processed in UPIMS.

- The issue of priority in data-processing

There is an annual quota set down by the local government for restricting the numbers of people who

want to move into Dalian city. Therefore, which social group or what kind of individuals shall have the priority in information processing, and how to fairly treat the others are intrinsically complex issues in developing the UPIMS. Ethical judgement as a result has been quite often called for from the system developers and managers in terms of classification and ranking of demands made from different social groups such as union of married couples, resettlement of ex-service people, new recruitment, graduate employment, etc.

- Privacy protection and policing information control

If the necessity and workability of a system like UPIMS are taken as given, the balance between sensitivity of data collection and processing on the one side and effectiveness of policing on the other is always of concern to the police and the local citizens. Though systems like the UPIMS may sound like a joke for many westerners, there could be similar practices in their own countries, like in the UK where certain residential information held by the Drivers and Vehicle Licensing Authority (DVLA) are implicitly and routinely passed on to the local police. A system like the UPIMS means a lot in China and could have an impact on millions of people living there. The mandatory data requested by the UPIMS has been put under scrutiny from time to time, and from place to place, in order to draw an appropriate line for maintaining residents' privacy, though to a limited extent only. Decades ago, even the furniture layout in a married couple's bedroom was implicitly regarded as "residential information" for the local police constables, and they were actually encouraged to dig into such sort of information for excellence in their job performance! The UPIMS now explicitly makes the demarcation between what is necessary for police and what is not, and highlights the boundary for privacy protection, even if where the demarcation is drawn would still be subject to severe criticism by some of the authors of the paper.

- Security and access to the data

This concern has occasionally been highlighted by "accidents" rather than through formal channels. For UPIMS, the biggest concern is the abuse or leakage, voluntarily or involuntarily, of resident's "profile" to unauthorised third parties. Previously, all residential information about a citizen, though extensive, was kept by a local police constable (who was known to the citizens concerned) manually and personally. Any enquiry about ones' residential information must go through this constable first and foremost. Resident's trust in UPIMS over such information storage is however subject to a question mark when they are aware of the constant "adventures" of hackers, and data sharing practices between government agencies.

4.3 Considerations on being ethical in UPIMS development

Ethical issues and moral concerns relating to UPIMS and its development activities have been acknowledged and considered by both the Dalian police as an institution and the systems developers as individuals. Though it seems people might share the same end towards achieving ethical standards in ISD, the concrete striving for 'being ethical' could be often made on wide variety of grounds, with each having strength of its own. We will now explore and discuss various approaches that the Dalian police have employed in promoting ethical considerations in UPIMS development. The focus of the discussion is to develop insights into the workability (strength/weakness) of the two ethical approach models and the interactions between them.

1. Highlighting ethical principles and requirements through communiqués and circulars.

The UPIMS steering commission and managing organisation have recognised potential ethical challenges involved in the project, prominent moral issues have been clarified for those participating in system development through circulars, memos, news-bulletin and other communication channels. Certain bottom line rules of conduct were prescribed for system developers in the form of decision frameworks or decision-making steps. The aim of such efforts is to put ethical considerations in UPIMS development explicitly on a verifiable basis. So far, the ethical requirements set by the UPIMS steering bodies range from winning trust, regaining support and rigorous consultation, to respect resident's legally protected privacy, appropriate methods of work and similar concerns. Guidance for professional behaviour and rules of conduct have been made available from project regulations and directions issued by the steering committee.

Such efforts are obviously good at spelling out explicitly basic values and safeguarding the bottom line of the ISD practices. However, a candid survey reveals that few system developers working on UPIMS have subscribed to the moral injunctions, rather, most of them have their own different moral pictures and they would ridicule the moral prescriptions where contradictory. Therefore, the inspirational and educational functions of such moral prescriptions have been devaluated.

2. Introduction of effective problem-solving techniques for addressing ethical concerns.

The Dalian Police initially intended to develop the UPIMS through outsourcing, as they consider that the success of the whole project will rely heavily on the technological expertise and advancement. While for

various reasons including social and ethical factors, the project was actually carried out in-house by Dalian Police's own ICT staff, using software engineering tools and methods. Emphasis has been projected onto the functions of formal working procedures and methods for ethical decision-making within project's internal communications. Various techniques for consultation, negotiation/compromise, or co-ordination and related expertise were made available upon request during the process of UPIMS development. It has been stressed that it is important to have ethical concerns in ISD checked by, and referred to, an upper level, or in a collective manner. Training on effective problem solving skills, regarding both moral and legal issues, is supposed to be given to every police officer involved in developing and operating UPIMS from the very beginning. Understandably, this does not extend to questioning the morality of the UPIMS development as a whole.

3. Role modelling in UPIMS development.

It has been stressed throughout the whole UPIMS development process that a perfect (or rather, nearly perfect) working behaviour or pattern shall be identified and singled out for citation and imitation. It could be an individual officer's personal work routine, or a work pattern from a recognised policing group working on UPIMS. When the role model has been extracted either as an image based on reality or as an imaginary ideal, a campaign will be launched for learning from such model in a wider context, by the development professionals themselves or by the steering committee upon the former's recommendation. Basically, personal moral character has always been considered as foremost and subsequently used to persuade others to do similarly rather than through verbal skills. The Dalian police force is convinced as an organisation that "ethical people will behave ethically on whatever subject", and this assumption is actually deeply embedded in Chinese culture. Both the development professionals and the UPIMS steering committee trying to make use of this cultural conviction in project development and management.

4. Development in organisational culture and morality.

Development of a "Healthy organisational culture" is encouraged by the project steering committee and is being actively introduced in UPIMS development to maintaining ethical standards of behaviour. This means that various sub-groups involved in UPIMS development are assessed in respect to their overall achievement of professional capabilities and other aspects of organisational maturity. In Dalian, an organisation's culture is considered healthy when the team could work on a consistent and competent basis, and meanwhile show sympathy to all sorts of needs demanded by outsiders upon that organisation and act

appropriately as any decent mature individual would do. Though what 'a decent mature individual' would do or would be is hard to define in substantial moral terms, in a given cultural context like China, people seem to have few problems in setting the standards. Rather than having a development team full of computer wizards who unfortunately knew nothing about social interactions, organisations involved in UPIMS development, mostly police stations at district level, prefer those that pay much more attention to their positions and responsibilities in public life and adjust accordingly where necessary and possible.

Systems developers are therefore supposed to recognise the level of moral development in an organisation and make their judgements accordingly. In other words, the maturity at different levels calls for different moral reactions in a given context. One should respect and abide by the extent of development of the organisation, rather than persistently championing laudable values or moral practices in a situation where moral sense has been under-developed. The individual must first learn to do what is appropriate in the organisation. In a centralised state where officialdom has traditionally enjoyed many unfair privileges, practices labelled as ethical by the system developers on UPIMS would probably be different from those conceptualised by most Westerners. But this should not stop them from self-reflecting on their moral practices against moral development in a particular organisation. In this sense, the Chinese authorities have reasonable grounds in claiming "Chinese Characteristics" for some of its policies and practices, though quite often they deliberately manipulate the notion to their own advantage. Since only they themselves understand the level of development in its economic and social life, which of course, include maturity in moral judgement.

Not surprisingly, efforts made by the Dalian police towards being ethical in developing UPIMS did not, and could not indeed, run comfortably and successfully throughout the project development. What was intended to be a campaign for ethical conducts initially very often resulted in hypocritical activities, and the ethical process or procedures prescribed by the steering committee have also been easily manipulated with other unanticipated considerations. Nevertheless, what has been demonstrated and highlighted in Dalian's UPIMS development could contribute some unique perspectives for considering ethical performances in ISD. This case analysis shows that in an ISD project as sensitive as the UPIMS in Dalian, efforts striving for ethical conduct could be made from many points of consideration. Rather than focusing exclusively on any particular ethical approach, attempts at the promotion of ethical activities and performance could

possibly be tried from a wide range of areas, and it is actually necessary to do so.

5. Summary and Future Work

Efforts striving towards being ethical in ISD could generally be made in two ways. One is the implementation of a methodological approach, which puts ethical considerations on a procedural basis so as to think and act rationally in ISD. The other one is to place emphasis on the agent's moral character and maturity in making judgements. This highlights the necessity and desirability of achieving a reflective equilibrium driven by moral virtues in professional conduct. Maturity in capability of making moral judgement in different organisations also has a direct impact on the practice of ethical activities in ISD. These two approaches have often been compared as rivals in extant literature on ethical ISD, while a study on UPIMS development in Dalian, China, shows that the two approaches could actually be incorporated in one project without necessarily incurring conflict or compromise. Indeed, it is necessary on empirical grounds for them to be jointly applied in China. Each of the two models reviewed in the paper has its own strength and weakness in addressing ethical problems in the course of actions on ISD. The relationship between the two approaches exists in that the latter could complement and shape the effectiveness of the former, while the methodological approach could also inform phases of decision making for the latter alternative model in the process of application.

Such a way of combining the two considerations toward being ethical in ISD could provide practical guidance regarding ethical performance without necessarily losing theoretical justification. It could be regarded as an effective paradigm for examining and evaluating ethical activities in ISD. However, elaboration of theoretical and empirical aspects of such an attempt seems to remain at a superficial level and lack systematic exploration, if the integrated approaches are to be taken seriously for considering ethical issues involved or embedded in ISD on a practical ground. Further research efforts are called for in respect to ascertaining contextual factors that influence maturity in moral judgement, clarifying operational mechanism of certain well-tested decision making procedures, and reconciling the claims made by universal values and on ethical relativism justified by specific cultural settings. One of the authors is now working on his PhD thesis that covers some of the issues raised here. His review on current research literature about practical approaches for promoting ethical ISD behaviour shows that work on these aspects is insufficient and needs improvement in terms of both quality and quantity.

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