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The application of causality to construction business ethics

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Abstract

Purpose – This paper aims to investigate two causality concepts, sphere of control (SOC) and agent–action–results (AAR), and their potential applications to construction business ethics. SOC is used in ethics training, and AAR is applied to ethical decision-making (EDM).

Design/methodology/approach – A framework of ethics training and a framework of EDM for construction companies have been developed. Interviews were conducted with experienced construction engineers and PhD ethicists to test the validity of the EDM framework.

Findings – Literature review has been conducted in ethical issues, ethics training and EDM, leading to the developments of the frameworks. The framework of ethics training incorporates SOC to reflect the ethicality and personality traits. The framework of EDM is based on AAR, combined with a stakeholder approach and Kohlberg's cognitive moral development theory, with a review from EDM models in business. Both frameworks include project-level component to reflect the unique feature of the construction industry. The framework of EDM showed a good practicality through the interviews on an ethical dilemma example.

Research limitations/implications – For the ethics training framework, a long-term observation or survey should be accompanied to evaluate the framework in detail, tracing the improvement of ethicalness of course participants.

Practical implications – The customized ethics training will be more efficient and effective, as it considers individual ethicality. The scoring system of the EDM framework is simple and practical. This is particularly relevant for construction ethics management, considering that most of construction practitioners are engineers, not philosophers or psychologists.

Originality/value – Applying causality concepts, SOC and AAR, to construction ethics is a novel approach in construction management. This research has made a good advancement in construction ethics management by providing the right directions to be explored in these new areas.

Keywords Causality, Ethics training, Ethical decision-making, Construction project, Agent–action–results (AAR), Sphere of control (SOC)

Paper type Research paper

Introduction

Background

In the construction industry, relatively less attention has been paid to ethics, compared to the advancement in management and technology in the industry. It could be argued that even though efficiency and effectiveness of corporate and project performance in construction have been improved through innovations and technological achievements, the ethical aspect of the industry is progressing relatively slowly. According to the Bribe Payer Index of Transparency International (TI), public works contracts/construction is the business sector most prone to bribery, followed by real estate and property management, and oil and gas (Transparency International, 2008). Further a number of research works show that the ethical standard of the construction industry cannot meet the expectations of the public. Construction is a project-based industry that draws together many different types of project participants such as clients, architects, engineers, contractors,

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subcontractors and suppliers. These participants often have different values which can influence their perceptions of performance in executing construction projects. If these values and individual goals are not aligned at the onset of a project, the participants could easily have different priorities and ways of working which may lead to confrontational situations. There is a potential that different cultures, goals and values could manifest themselves in different levels of ethical awareness and adherence among the project participants. However, project-level ethics management has not been focused in the construction industry. Thus, effective project-focused ethics management could lead to a better understanding of the different values that exist throughout the supply chain of construction projects. This will improve the basis of trust within relationships and the collaborative performance of project participants.

In practice, consequentialism is the dominant ethical theory in construction. Therefore, in most instances, the moral value of an action depends on its results, e.g. cost-benefit analysis. As a result, the root causes of the consequences are not dealt with properly, leading to problems related to ethicalness of construction professionals. To resolve these problems in practice, a systematic approach should be developed. According to [Kohlberg \(1969\)](#), as people progress through the stages of moral development, they may change their values and ethical behaviours with time, education and experience. In the context of business, an individual's ethical development can be influenced by ethics-based training and appropriate leadership ([Ferrell et al., 2010](#)). The causes of most ethical misconducts are related to ethical decision-makings (EDMs), and the causes of poor EDMs stem from immature moral developments of the decision makers. Consequently, to enhance moral development and make more ethical decisions, efficient and effective ethics training and EDM systems should be developed and implemented. In this research, two causality concepts – sphere of control (SOC) and agent-action-results (AAR) – have been adopted. SOC is used to develop the ethics training framework, and AAR is used as the foundation theory for the EDM framework. SOC measures personal perceptions on causality and ethicality, and AAR is based on virtue ethics, deontology and consequentialism. AAR is combined with Kohlberg moral development theory and stakeholders of construction projects.

Aim and objectives

The aim of this paper is to provide an ethics training framework and an EDM framework for construction companies, incorporating causality concepts and including project-level approaches to reflect the unique feature of the construction industry.

The objectives of this paper are:

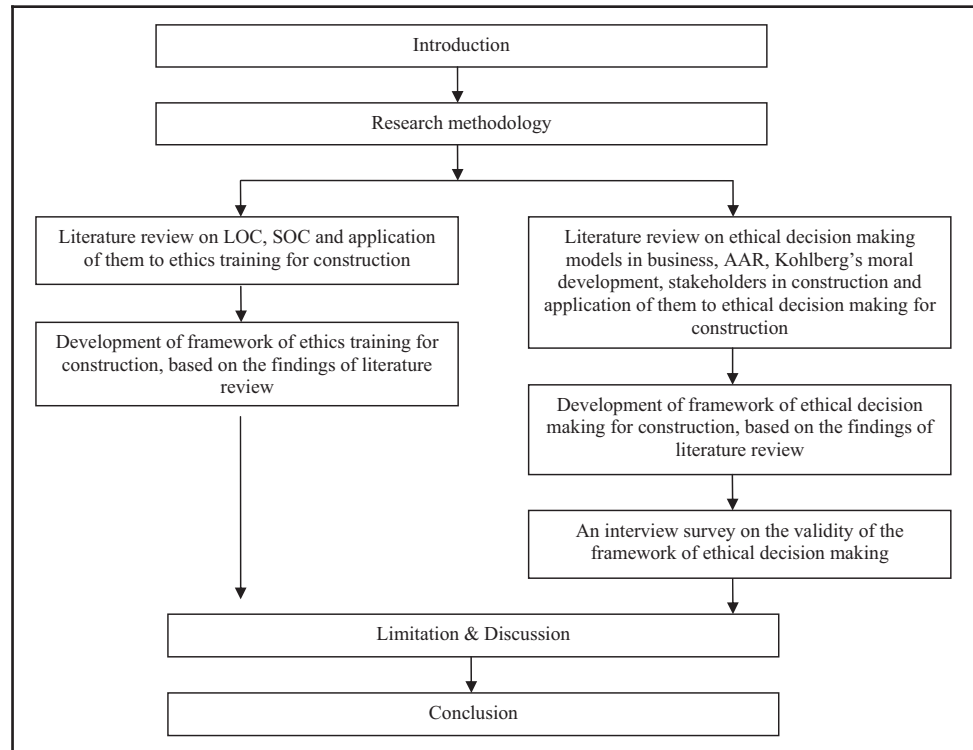
- to provide an ethics training framework for construction companies by incorporating the causality of SOC and project-level approaches; and
- to provide an EDM framework for construction companies by incorporating project-level approaches and the causality of AAR, combined with the moral development theory and the concept of stakeholders in construction projects.

Research methodology

[Figure 1](#) is a flowchart of the research methodology showing the process of the research. The research is conducted in parallel for both ethics training for construction and EDM in construction. Extensive literature review has been conducted for both ethics training and EDM, and two frameworks for construction have been developed based on the literature review.

A qualitative survey was conducted to test the validity of the EDM framework. Four experienced construction engineers and two PhD ethicists were involved in the interviews to provide possible ethical solutions to a given ethical dilemma. A vignette was developed based on TI's report on corruption. The situation in the vignette was well-explained to the

Figure 1 Flowchart of the research



interviewees together with written notes to help the interviewees fully understand the scenario. The process and findings are described in “SURVEY UNDERTAKEN” section in this paper. Table I shows the profiles of the interview participants.

Literature review

Ethical issues in construction

Extensive and intensive literature reviews have been conducted in construction ethics. Research works show that ethical issues are spread over throughout the life cycle of construction projects. Thus, the project-level approach should be emphasized for effective

Table I Profiles of the interviewees

Type	Interviewee	Education	Experience	Expertise
Construction engineers	One	BEng*	20 years' experience including 11 years in international projects	Civil engineering
	Two	BEng	22 years' experience including 10 years in international projects	Electric engineering
	Three	BEng	22 years' experience including 12 years in international projects	Building engineering
	Four	BEng	25 years' experience including 17 years in international projects	Civil engineering
Ethicians	Four	PhD	8 years	Ethics
	Five	PhD	6 years	Global ethics

Notes: Actual interviews were conducted; *Bachelor of Engineering; ** Doctor of Philosophy; *** Saudi Arabia

and efficient ethics management in construction. Jackson (2005) conducted a survey on ethical issues for experienced US construction practitioners and found that the top five frequent issues are “Improper Bidding”, “Misrepresentation of Completed Work”, “Poor Quality Control”, “Technical Incompetence” and “Abuse of Company Resources”, and top five serious issues are “Alcohol and Drug Abuse”, “Improper Bidding”, “Failure to Protect Public Health, Safety”, “Poor Quality Control” and “Abuse of Client Resources”. Fan *et al.* (2001) argued that quantity surveyors attach great importance to the interest of their clients and employers, and the general public is not considered as an important party when resolving ethical dilemmas. From a study of UK construction managers’ views on ethical perceptions, the top five unethical behaviours are identified – “Producing falsifying reports”, “Over-claiming expenses”, “Having low level of personal honesty”, “Having deceptive advertisement” and “Providing trade secrets in order to exchange for personal benefits” (Poon, 2004). At the tendering stage, the ethical issues include improper tendering practices such as withdrawal, bid cutting, cover pricing, compensation of tendering costs (Ray *et al.*, 1999) and collusive tendering behaviour (Zarkada and Skitmore, 2000). Vee and Skitmore (2003) identified unethical conducts in the form of unfair conduct, negligence, conflict of interest, collusive tendering, fraud, confidentiality and propriety breach, bribery and violation of environmental ethics in the construction industry. These findings reconfirm that the ethical situation in the construction industry needs to be improved.

Ethics training for construction

Ethics in construction can be enhanced mainly by appropriate ethics training and EDM to progress the moral development of the decision maker(s). However, the reality in the construction industry is that ethics management is unstructured and the importance of training and education in ethics is somewhat neglected. This paper suggests a basis of ethics training for construction. The following sections explain the concepts and ideas used in the ethics training programme. To increase the effectiveness of the training, SOC has been incorporated in the programme.

Locus of control and ethicalness. Locus of control (LOC) is a psychometric instrument designed to assess how much control an individual believes he/she has over outcomes in life. It is based on whether an individual sees a causal relationship between his/her behaviours and the potential outcomes of these behaviours. An *internal* person believes in a causal link between his/her own actions and the expected outcomes. Internals believe that the consequences of their lives are directly related to the decisions they make and the actions they take, so they are more apt to exert themselves when engaged in important tasks. An *external* individual believes that the expected outcomes are not linked to his/her efforts, but to the control of luck, fate or powerful others. They do not generally believe in the acceptance of responsibility for what happens to them. They believe in societies where success is probably perceived as being more a function of luck or of being related to the right people than it is of effort or ability (Rogers and Smith, 2001; Lefcourt, 1990). There have been many measures of LOC. The following are the most popular measures (Lefcourt, 1990):

- Internal–External (I-E) LOC Scale.
- Internality, Powerful Others and Chance Scales.
- Spheres of Control Scale (Paulhus and Christie, 1981).
- Adult Nowicki-Strickland I-E Control Scale.

Rotter’s I-E LOC Scale (23 items) is the most widely used and cited measures in the LOC literature. For example, item number 2 in Rotter’s LOC compares “a. Many of the unhappy things in people’s lives are partly due to bad luck” versus “b. People’s misfortunes result from the mistakes they make”. LOC has received considerable attention in the psychological literature (Smith *et al.*, 1998). In the field of business ethics, LOC has been

linked to ethical beliefs and perceptions, and EDM in a number of studies (Rogers and Smith, 2001; Smith *et al.*, 1998). Rogers and Smith (2001) and Smith *et al.* (1998) claimed that most of LOC studies have indicated support for the internal/external distinction related to EDM and the belief that internals supply the more ethical responses. Granitz (2003) established that LOC is a significant determinant together with social ties, personal moral intensity and code of ethics in ethical reasoning and moral intent of managers. Nebenzahl *et al.* (2001) used LOC to explain consumer reaction to ethical purchasing dilemmas in Israeli and Turkish consumers. Those respondents having higher internal LOC were found to be more ethical.

SOC and ethics training. Rotter's I-E Scale is the most widely used measure in LOC, as mentioned above. However, the scale is complicated, and it is difficult to make choices. In addition, it does not clearly identify the dimensions, even though it seems to comprise personal control and social control systems. Consequently, interpersonal behaviour, which is one of the major clusters of LOC items, is absent in Rotter's I-E Scale (Paulhus and Christie, 1981). Paulhus and Christie (1981) developed SOC comprising *personal control, interpersonal control and socio-political control* (30 items), examples of these are, respectively, "I can usually achieve what I want when I work hard for it", "In my personal relationships, the other person usually has more control over the relationship than I do", and "By taking an active part in political and social affairs we, the people, can control world events". SOC is more organized and comprehensive than Rotter's I-E scale. It is also possible to introduce Likert scale or true-false scoring format in SOC, which increases the flexibility and efficiency of the scale.

In this research, SOC is adopted as a measure of perception on causality and ethicality, as construction projects comprise various participants (clients, architects/engineers, contractors, subcontractors and suppliers) with different levels of ethical and moral development and interpersonal relationships. In addition, SOC will allow customized ethics training by grouping people according to their personality and ethicality traits – e.g. "focus group". For example, *external* groups in *interpersonal control* can have ethics training programmes focusing on the reinforcement of interpersonal control. SOC will also allow practical assessments of the results of training programmes. Table II shows the suggested ethics training programme for construction with the application of SOC. As the Ford Pinto case shows, serious consequences might occur if a sole ethical theory is applied to engineering fields (Martin and Schinzinger, 2010 and Harris *et al.*, 2005). Further gaps between ideal ethics and practice of ethics can be found in ethics education (Duarte,

Table II Ethics training programme for construction projects

Course type	Title	Description
Common course	Ethical issues	Ethical issues in construction and business
	Foundation of ethical theories	Principal ethical theories such as virtue ethics; deontology; utilitarianism; Kohlberg's moral development theory
	Code of ethics	Codes of ethics in the construction industry, professional associations and corporations
	Project-specific code of conduct	Project-specific codes of conduct reflecting ethical issues related to the construction projects
Individual course	SOC-based personality and ethicality test	SOC-based personality and ethicality tests for individual employees
	Grouping of individual employees	Grouping of individual employees by externals of personal control, interpersonal control and socio-political control, e.g. focus group
	SOC-based customized ethics training	SOC-based ethics training to reinforce weak control areas for each group, e.g. personal ethicality and responsibility training programme for externals of personal control group

2008). The ethics training should comprise harmonization of ethical theories such as end-oriented utilitarianism, mean-oriented deontological theories, virtue ethics, etc. (Corvellec and Macheridis, 2010; Helgadóttir, 2008). The project-level approach is enhanced by inclusion of “Project Specific Code of Conduct” which will be practically efficient and effective in actual construction projects. The framework is designed to resolve not only the ethical issues but also the causes of ethical weakness, differently from the commercially available ethics training programmes which focus on instant outcomes. To test the validity of the framework, a long-term survey will be required to trace back the ethical improvements of the course participants.

EDM for construction

EDM in Business. Literature on EDM in business has been reviewed to investigate the possible applications to construction. A number of studies have been found in business journals such as *Accounting, Auditing, and Accountability Journal, Academy of Management Review, Journal of Academy of Marketing Science, Journal of Business Ethics, Journal of Business Research, Journal of Marketing* and *Journal of Personal Selling and Sales Management*. According to the review of empirical EDM literature during 1997-2003 by O’Fallon and Butterfield (2005), about 73 per cent of findings of EDM were published in the *Journal of Business Ethics*, which is the most well-known ethics journal in business. They also identified that individual factors and organizational factors were two main areas of the study. Before O’Fallon and Butterfield, Loe *et al.* (2000) conducted a similar review in 2000 including articles from 70s and 80s. Table III summarizes the findings of both reviews in terms of individual and organizational factors, and the applications in this research.

By the comparison of the findings of the two studies, the trend of research in EDM in business can be interpreted. Nationality, moral development, religion, code of ethics and significant others are the areas with a positive research trend. The constructs which show negative trends are age, intent, ethical climate/culture, rewards/sanctions and opportunity. As only a few percentage of construction professionals are women, gender has not been considered as a subject in this research.

Table III Individual and organizational factors of EDM

<i>Construct</i>	<i>O’Fallon and Butterfield (2005)</i>	<i>Loe et al. (2000)</i>	<i>Applications in this research</i>
<i>Individual factors</i>			
Gender	Rank 1 (49 times)	Rank 1 (26 times)	
Moral philosophy	Rank 2 (42 times)	Rank 2 (21 times)	Framework of ethics training and ethical decision-making
Education and work experience	Rank 3 (41 times)	Rank 3 (18 times)	
Nationality	Rank 4 (25 times)	Rank 5 (10 times)	
Moral development	Rank 5 (23 times)	Rank 6 (6 times)	Framework of ethics training and ethical decision-making
Age*	Rank 6 (21 times)	Rank 4 (15 times)	
Locus of control	Rank 7 (11 times)	Rank 7 (4 times)	Framework of ethics training
Religion	Rank 8 (10 times)	Rank 9 (3 times)	
Intent*	Rank 16 (1 time)	Rank 7 (4 times)	
<i>Organizational factors</i>			
Code of ethics	Rank 1 (20 times)	Rank 2 (17 times)	Framework of ethics training and ethical decision-making
Ethical climate/culture*	Rank 2 (16 times)	Rank 1 (18 times)	
Rewards and sanctions*	Rank 5 (7 times)	Rank 3 (15 times)	
Opportunity*	Rank 11 (2 times)	Rank 5 (3 times)	
Significant others	Rank 3 (10 times)	Rank 4 (11 times)	Framework of ethical decision-making

Notes: Bold indicate positive trends of research in terms of “rank”; *indicates negative trends; total numbers indicate the number of findings of each independent factor, not the number of articles; the number of articles included in O’Fallon and Butterfield’s (2005) study is 174 and that in Loe *et al.*’s (2000) study is 123

In construction, [Ohrn \(2002\)](#) suggested foundations of ethical judgement in respect of morals and values. The morals are “the impact of a decision on the reputation of organizations or individuals”, “the organization’s ability to get work in the future” and “the relationships with construction partners such as subcontractors and suppliers”. The values are honesty, integrity, competency, objectivity and fairness. [Liu *et al.* \(2004\)](#) suggested a model of organizational ethics for construction. The model is based on cosmopolitan factors such as laws and professional bodies’ code of ethics; local (corporate) factors such as ethical climate, ethical culture and code of ethics; and individual factors such as individual ethics. [Suen *et al.* \(2007\)](#) discussed how the teachings of Confucianism, Taoism and Buddhism and Globalization influence the understanding of ethical behaviours in Asian construction organizations. [Ho \(2011\)](#) identified the relationships between variables (individual; situational/organizational; moral intensity) and employees’ ethical behaviour in construction organizational contexts. [Casali \(2007\)](#) identified differences in EDM between business and non-business decision makers.

Relevant models of EDM have been reviewed and summarized in [Table IV](#). Most of models focus on individual and organization factors (shaded in [Table IV](#)). However, in construction, project-level factors should be included in the EDM, as construction is based on the project. In this research, a framework of EDM which is specifically suitable for construction has been developed. The following sections explain the main concepts incorporated in the framework and the process of the EDM.

Agent–Action–Results. There are many ethical philosophies and related theories. As a detailed research on the philosophies and ethical theories would be beyond the scope of this paper, the approach taken focuses on the most applicable concepts in a practically straightforward way to help understand ethical theories and develop a framework of EDM for construction. To develop a workable EDM process, major ethical theories and moral

Table IV Models of ethical decision-making in business

Reference	Publication	Components of model
Groves <i>et al.</i>, 2008	JBE*	Combination of Rest (1986) ethical decision-making framework (recognize moral issue, make moral judgment, establish moral intent, engage in moral behaviour) and moral intensity, organizational factors, individual/situational moderators, personal characteristics, thinking style
Cavusgil, 2007	JBE	Awareness of ethical issues → stages of moral development → moral evaluations by deontology/consequentialism → determination → (un)ethical behaviour
McDevitt, 2007	JBE	Organizational culture, opportunity, individual factors
Coughlan, 2005	JBE	Individual factors, job context, organizational context, external environment
Miner and Petocz, 2003	JBE	Importance of codes of ethics as guidelines for ethical decision-making
	JBE	Recognition of problem → problem clarification by rights, duty, norms, values → action identification and evaluation by individual, cultural, professional values and ethical theories → action choice and implementation
Carroll and Buchholtz, 2003	Business and Society	Individual, organizational, societal, international norms; ethical theories; ethical tests and guidelines
Ferrell <i>et al.</i>, 2010	Business Ethics	Ethical issue intensity, stages of moral development, significant others, opportunity
Gaudine and Thorne, 2001	JBE	Incorporation of emotion in ethical decision-making process
Petrick and Quinn, 2000	JBE	Four dimensions (process, judgment, development and system dimensions) at the individual and collective levels
Chau and Siu, 2000	JBE	Work characteristics → stages of moral development → organizational and individual characteristics → ethical decisions
Robertson and Faldi, 1999	JBE	Individualism vs collectivism, interaction between stages of moral development and ethics training
Stead <i>et al.</i>, 1990	JBM	Five key factors: individual factors, ethical philosophy/decision ideology, ethical decision history, organizational factors, external forces
Liu <i>et al.</i>, 2004	ECAM**	Cosmopolitan, organizational, individual factors

Notes: **Journal of Business Ethics*; ***Engineering Construction and Architectural Management*

development need to be introduced into the framework. The main ethical concept introduced in this paper is AAR (Figure 2).

According to this causality concept, an action is performed by some agent who has an inner intention and which leads to certain external results. The ethical theories in the framework are briefly explained below:

- *Virtue ethics* stresses the importance of developing good habits of characters such as wisdom, courage, temperance and justice, as emphasized by Plato. Aristotle established “the reasonable middle ground” which avoids unreasonable extremes.
- *Deontology* bases morality on specific foundational principles of obligation, irrespective of the consequences as argued by Immanuel Kant.
- *Consequentialism (utilitarianism)* considers that an activity is right or acceptable if it maximizes total utility for the society or for the greatest number of people. One tool often used in engineering and construction projects in terms of a utilitarian approach is the cost–benefit analysis.

Kohlberg’s cognitive moral development. Most of the models developed to explain, predict and control ethical behaviour of individuals within a business organization propose that cognitive moral processing is a crucial element in EDM (Ferrell *et al.*, 2010). Kohlberg’s (1969) model identified attitude and behaviour by development level. He proposed the following six stages of moral development:

1. *Level 1: Pre-conventional stages*
 - *Stage 1:* Punishment and obedience orientation
 - *Stage 2:* Instrument and relativist orientation
2. *Level 2: Conventional stages*
 - *Stage 3:* Interpersonal concordance orientation
 - *Stage 4:* Law and order orientation
3. *Level 3: Post-conventional stages*
 - *Stage 5:* Social contract orientation
 - *Stage 6:* Universal ethical principle orientation

According to his model, different people make different decisions in similar ethical situations because they are in different stages of cognitive moral development. In this research, for practicality and simplicity, the three levels of moral development are applied to EDM for construction.

Kohlberg’s cognitive moral development theory has been modified in this paper by the authors, as presented in Table V, to identify and characterize the various stages of moral development for individuals, project teams and organizations in construction. In corporate moral development, narrow market-based stakeholders include shareholders and project participants – clients, designers (architects/engineers), main contractors, subcontractors, supplier and end-users – while broad range of stakeholders includes shareholders, project

Figure 2 Agent, action and results

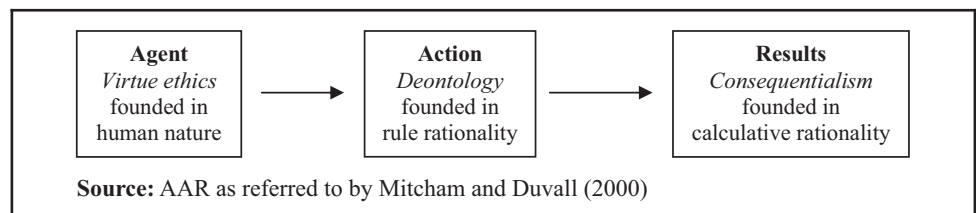


Table V Individual, project team and corporate moral development

	<i>Individual moral development</i>	<i>Project-team moral development</i>	<i>Corporate moral development (Logsdon and Yuthas, 1997)</i>
Level 1 Pre-conventional morality (Legal)	Decisions are taken to satisfy nothing but the decision maker's interests	Decisions are taken to satisfy nothing but the project team's interests	Decisions are taken to satisfy nothing but the organization's interests
Level 2 Conventional morality	Decisions are taken to satisfy the expectations of peers	Decisions are taken to satisfy the expectations of project participants	Decisions are taken to satisfy the expectations of narrow market-based stakeholder relationships
Level 3 Post-conventional morality	Decisions are taken to achieve social consensus	Decisions are taken to satisfy the expectations of project end-users	Decisions are taken to satisfy the expectations of broad range of stakeholders

participants, central/local government, environmental groups, civic groups, the general public, etc. The project-level approach is reinforced by "Project-Team Moral Development" which reflects one of the unique features of construction projects. A review on EDM models in business, the applications of AAR, Kohlberg's moral development and stakeholder theory lead to the development of an ethics screen through which different ethical decisions can be evaluated. This is explained in detail in the next section.

Findings and developments from literature review

Ethics screen

The construction industry is typically project-based and highly resource-intensive. Therefore, project-level ethics management should be included together with individual- and corporate-level. The construction-based moral development concept (Table V) is then combined with the ethical theories and produces an ethics screen which consists of major ethical standards and codes of ethics and conduct against which ethical decisions can be compared and checked (Table VI). In *Action* levels, codes of ethics have been divided into corporate codes of ethics and project-specific codes of conduct which are project-level guidelines on ethical decisions and actions to reflect the unique situations of individual projects.

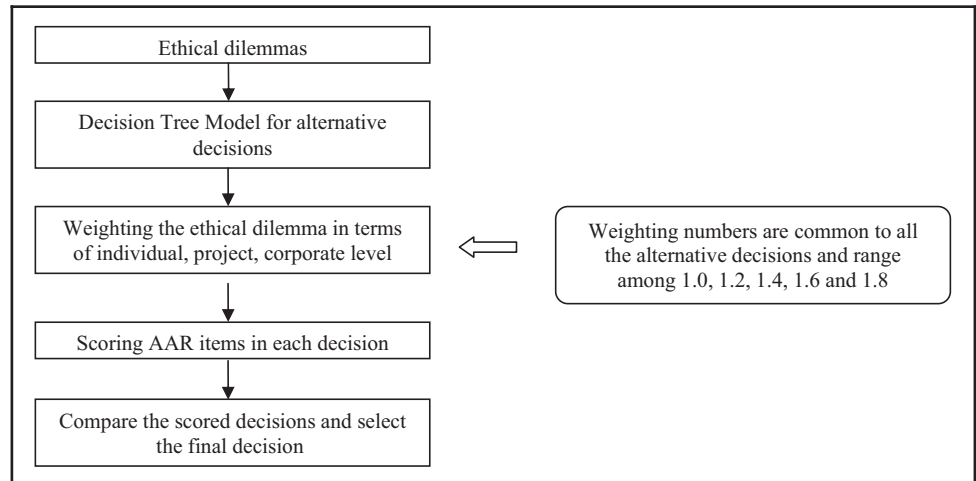
Process of framework of EDM for construction

Figure 3 shows the proposed process of EDM for construction. In this process, the alternative decisions for ethical dilemmas can be produced through decision tree models.

Table VI Ethics screen

Individual level	Virtue ethics (Agent)	Moral development of the decision maker
	Deontology (Action)	Codes of ethics of professional associations
	Consequentialism (Results)	Ethical leadership and reputation of the decision maker in project and company
Project level	Virtue ethics (Agent)	Moral development of the project team
	Deontology (Action)	Project-specific codes of conduct
	Consequentialism (Results)	Ethical supply chain of the project
Corporate level	Virtue ethics (Agent)	Moral development of corporation
	Deontology (Action)	Corporate codes of ethics and industry codes of ethics
	Consequentialism (Results)	Corporate reputation and image

Figure 3 Process of framework of ethical decision-making for construction



Once the problem and the possible solutions have been understood, the ethical dilemma is rated as individual, project and corporate level to decide the weightings of each level. To avoid a bias on a particular level, the weighting numbers range among 1.0, 1.2, 1.4, 1.6 and 1.8. The alternative decisions are filtered in an ethics screen to be individually scored in terms of ethicalness. The scores show the ethical rank of the possible decisions. As mentioned previously, weightings and scorings of the decisions depend on the experience, knowledge and level of moral development of the decision maker. An example of the EDM process has been presented in detail.

Decision trees are simplified models of the real problems. They provide well-organized frameworks to analyse decision alternatives for given ethical dilemmas. In reality, many ethical decisions are a series of related sequential decisions. The decision tree model helps develop sequential decisions and related outcomes in a logical way. The benefits of decision tree models are (Bunn, 1984; Goodwin and Wright, 1991):

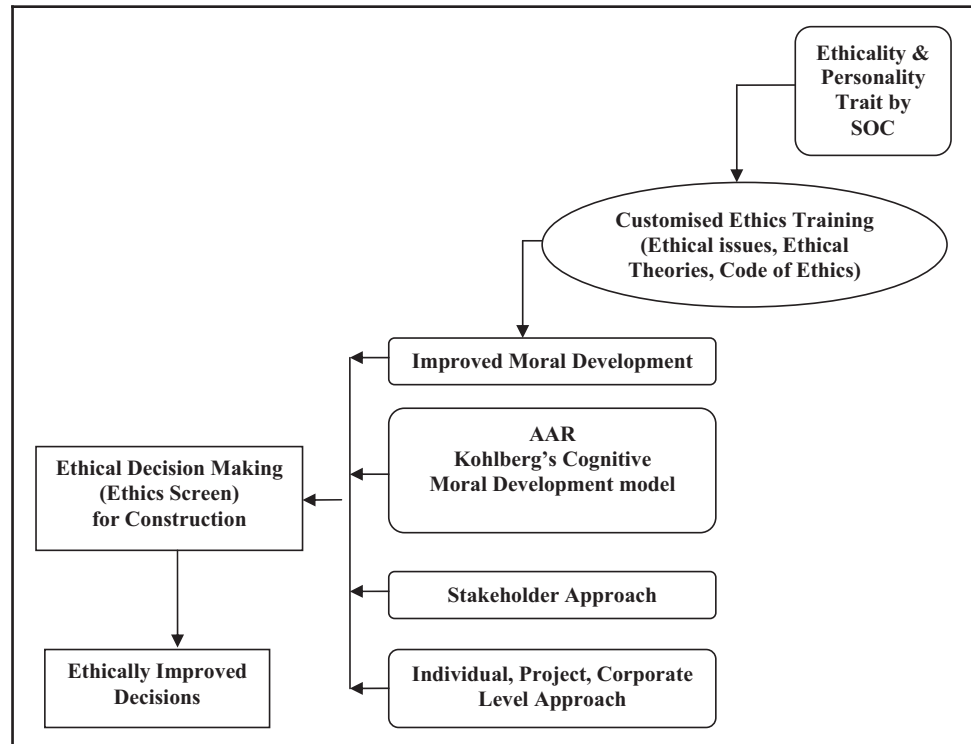
- to help a decision maker develop a clear picture of the ethical dilemma;
- to determine the possible outcomes of each decision;
- to develop creative thinking and generation of alternatives;
- to judge the nature of information to be gathered to solve the given ethical dilemma; and
- to communicate easily with other individuals because of the simplified format.

In this paper, the alternative decisions are compared as “ethical” versus “unethical”, or “more ethical” versus “less ethical”, which enable the decision maker to grasp intuitive insights on the given situations. In the process, the decision maker can develop alternative decisions and possible outcomes which will be framed in a concise and structured format to be evaluated and quantified through an “ethics screen”. This will enable the decision maker to clarify the priority of the alternative decisions more ethically and objectively.

Connection of ethics training and EDM

This paper suggests ethics training and EDM as the cores of ethics management in construction, leading to the developments of the frameworks. Figure 4 shows connection of ethics training and EDM developed through this research. As can be seen in Figure 4, the ethics training framework comprises common courses and individual courses. Common courses consist of current ethical issues, ethical theories and codes of ethics and conduct. To reflect the project-based feature of construction, codes of ethics are divided into codes

Figure 4 Connection of ethics training and ethical decision-making



of ethics and project-specific codes of conduct. The individual courses are designed to develop customised ethics training to suit individual needs. The course participants are divided into three different groups based on their SOC traits at the beginning of the training. The EDM framework has been developed based on the other causality model in this paper, AAR. This AAR concept is combined with Kohlberg's cognitive moral development model and stakeholders in construction projects to produce the EDM framework. Project-level approaches are incorporated in the framework together with individual and corporate levels. The frameworks in this paper could be used to systematically improve ethical perceptions and EDM in the construction industry. The frameworks intend to include not only theoretical aspects but also practicalities.

Survey undertaken

The following sections explain the framework of EDM with the outcome of an actual interview survey which verifies the validity of the framework. To enhance the objectivity, the vignette has been developed based on TI's scenario. In addition, the possible decisions are the real answers from the engineers and ethicists who have participated in the interviews of this research.

Summary of attempted justifications for corrupt practice

"Attempted Justifications for Corrupt Practice" in the Introductory Report of TI (Stansbury, 2003) has been used as the basis of the vignette developed for the example of the framework. The following are outlines of "Attempted Justifications for Corrupt Practice":

- Corruption is an accepted part of life in the host country.
- Everyone does it.
- The cost of bribery is merely an essential business cost.
- If we stop bribing, our competitors will not stop.

- We have to inflate our claims to match inflated counterclaims.
- There is nothing wrong with minor facilitation payments.
- I suspect that bribery is taken place, but I do not personally know for certain that it is taking place.
- Our company uses bribery as part of its business practice.
- No one gets prosecuted.

Vignette for bribery

Mr. L, the director of D Construction Co., has recently received an informal offer through a very private routine – a contract broker. It is about a harbour construction project in a developing country. The total construction cost is \$200 million. The contract type is a Design and Build and a certain degree of sustainability is required throughout the project. Possible profit would be approximately 20 per cent of total construction cost. The contract broker also mentioned that the host government chose D Construction Co. because they are looking for a new business partner with a reasonable reputation in international construction projects with expertise in harbour engineering and sustainable construction. In addition, there should be a kickback of 10 per cent of the total construction cost. The host government already acknowledges that this kickback can be compensated by over-design and over-specification. If this project can finish successfully, D construction will have more opportunities of harbour construction projects in the country in the near future.

D Construction Co. has a good reputation in the region, and has an expertise in harbour engineering and sustainable construction. However, D Construction currently experiences severe financial difficulties, which may risk the survival of the corporation. This is due to the failure of a massive investment in tour business. Through his experience, Mr. L knows that corruption is an accepted part of business culture in the region and almost all of the construction projects in the host country are connected to bribery and corruption. Further, if D construction does not accept the offer, the competitors who bribe them will win the contract. Mr. L is also sure that 10 per cent is less than the average kickback percentage for this size of construction projects and eventually no one will get prosecuted. However, codes of ethics of D Construction, professional associations and the construction industry insist on no corruption and bribery in any situations. Contrarily, D Construction developed project-specific codes of conduct from the previous projects in the region. These project-specific codes of conduct allow gift-giving/bribery of the minimum level from the host country's cultural point of view. Because of its cultural background, the host country and neighbouring countries take it for granted that certain levels of gift-giving/bribery are necessary. They consider that these are positive parts of business transactions and reinforce human relationships.

Decision tree model for the vignette

Mr. L, the decision maker, is particularly in favour of Aristotle's "the reasonable middle ground (virtuous means)". He thinks deontology is too much concerned with *means*, whereas consequentialism is with *ends*. According to Aristotle, "Virtues are good habits of dealing with one's desires, emotions and actions in the way which avoids unreasonable extremes". (Arrington, 1998 Chapter 3, pp 73-77; Sahakian, 1974, Chapter 5, pp. 54-58). For example, with regard to the desire for food, temperance is the virtue of being reasonable, whereas gluttony is the vice of excess and austerity is the vice of deficiency. As an engineer, Mr. L interpreted the reasonable middle ground as "the objective optimization of means and ends". Consequently, the reflection of Aristotle's reasonable middle ground has influenced the following decision-making. He considered 10 per cent bribery is definitely unethical. However, the company's survival is one of the corporation's responsibilities to the stakeholders. In addition, he believes that the harbour project is very important for the people of the host country who are the eventual beneficiaries. After long

contemplation and an informal contact with the officers in charge in the host country, he concluded that corporate social responsibility (CSR) contribution to the host country can be a possible alternative to some of the bribery. He contacted four very experienced engineers in international construction projects and two PhD ethicists and received advice on this ethical dilemma. Table I shows the profiles of the advisors. Figure 5 describes the suggested decisions by the advisors.

Weighting the ethical dilemma

Mr. L, according to his experience and knowledge, has decided the weightings of each level of ethics screen for the ethical dilemma, as follows:

- individual level: 1.4;
- project level: 1.2; and
- corporate level: 1.8.

Corporate level has been considered the most important one, as the ethical dilemma is directly related to the business transactions of the corporation. Individual-level factors have been regarded more important than project-level ones. This is to reflect that, at this stage, the decision maker's role is more influential in the ethical consequences than the project team, as the project has not been officially initiated. Table VII shows the analysis of the alternative decisions against each item in the ethics screen, and Table VIII presents the scorings of the decisions which are based on the analysis.

Figure 5 Decision tree model

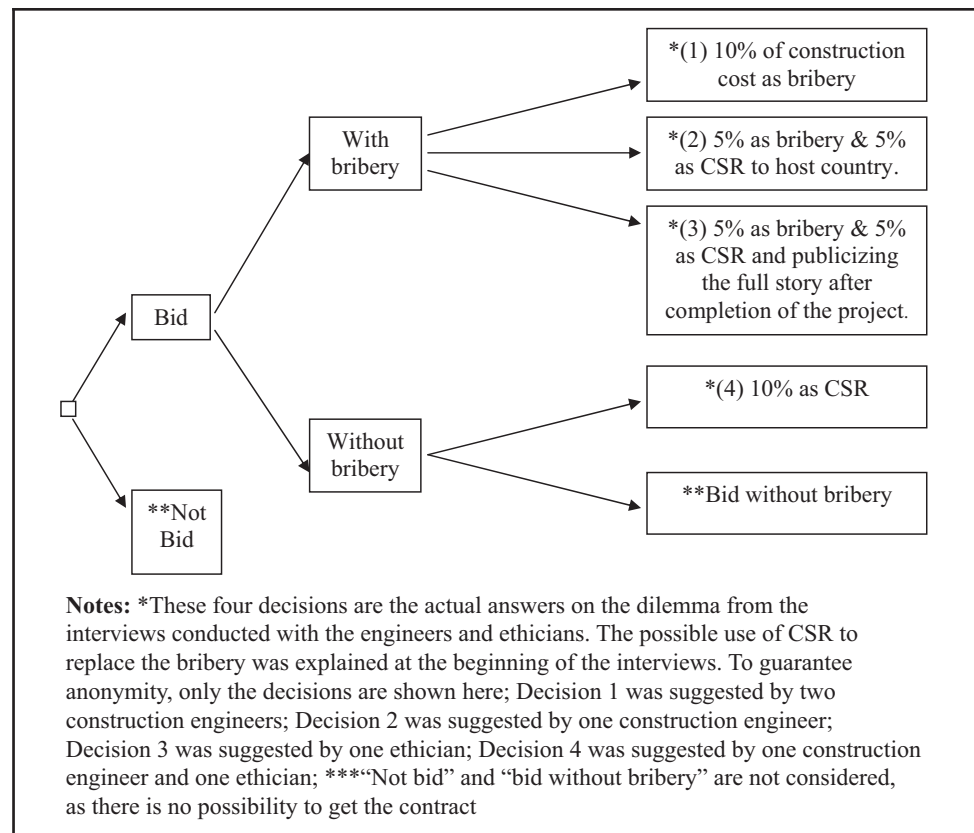


Table VII Analysis of alternative decisions

<i>Level</i>	<i>AAR</i>	<i>Descriptions</i>	<i>Analysis</i>
Individual (Mr.K)	Virtue ethics (Agent)	Which level is the moral development of decision maker? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	D1 is considered as pre-conventional morality to satisfy the expectation of the decision maker only D2 as conventional as 5 per cent CSR contribution is above the average ethicality in this kind of construction projects D3 and D4 as post-conventional as the decisions care for the society
	Deontology (Action)	Does this decision comply with codes of ethics of related professional associations such as Institute of Civil Engineers (ICE)? Fail (0) – pass (100)	Only D4 has been complied with the codes of ethics which prohibit bribery and corruption in any situations
	Consequentialism (Results)	What is the expected ethical leadership and reputation in project and company from this decision? Very unethical – 1(20) – 2 (40) – 3 (60) – 4 (80) – 5 (100) – very ethical	D1 is considered unethical D2 is considered to be the average ethicality due to the CSR contribution D3 and D4 are expected to increase the ethical leadership and reputation of Mr. L as it is quite objective and unselfish from bona fide third party's point of view
Project team	Virtue ethics (Agent)	Which level is the moral development of the project team? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	D1 is considered as pre-conventional morality to satisfy the project team's interests only D2 as conventional as 5 per cent CSR contribution can satisfy the expectations of the project participants D3 and D4 as post-conventional as the decisions care for the project end-users who are the general public
	Deontology (Action)	Does this decision comply with project-specific codes of conduct? Fail(0) – acceptable (50) – pass (100)	D1 can not satisfy project-specific codes of conduct D2 and D3 are considered to be acceptable according to the project-specific codes of conduct based on previous projects in the region, D4 comply with project-specific codes of conduct
	Consequentialism (Results)	What is the expected outcome in terms of ethical supply chain of the project? Very unethical – 1 (20) – 2 (40) – 3(60) – 4 (80) – 5 (100) – very ethical	D1 is very unethical D2 is expected to motivate the participants of the supply chain and encourage more ethical behaviours D3 can be considered as a courageous behaviour in future D4 will be a very good ethical example
Corporate (S Co.)	Virtue Ethics (Agent)	Which level is the moral development of corporation? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	D1 due to bribery is not ethical (pre-conventional) D2, D3 and D4 are considered to satisfy the expectations of broad range of stakeholders (post-conventional) as the CSR contribution is a progressive ethical decision compared to the previous projects in the region
	Deontology (Action)	Does this decision comply with corporate codes of ethics and industry codes of ethics? Fail(0) – pass (100)	Only D4 has been complied with the codes of ethics which prohibit bribery and corruption in any situations
	Consequentialism (Results)	What is expected outcome in corporate reputation and image from this decision? Very unethical – 1 (20) – 2 (40) – 3 (60) – 4 (80) – 5 (100) – very ethical	D1 is very unethical D2 is considered to increase the reputation of H Co. due to 5 per cent CSR contribution D3 can be considered as self-sacrifice of H construction in future D4 will enhance the reputation and image of H. construction, possibly making H construction the leader in CSR activities in the industry

Table VIII Scoring of alternative decisions

Ratings	Level	AAR	Descriptions	Decision 1	Decision 2	Decision 3	Decision 4
1.4	Individual (Mr.K)	Virtue ethics (Agent)	Which level is the moral development of the decision maker? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	33	67	100	100
		Deontology (Action)	Does this decision comply with code of ethics of related professional associations such as Institute of Civil Engineers (ICE)? Fail (0) – pass (100)	0	0	0	100
		Consequentialism (Results)	What is the expected ethical leadership and reputation in project and company from this decision? Very unethical – 1 (20) – 2 (40) – 3 (60) – 4 (80) – 5 (100) – very ethical	20	60	80	100
1.2	Project team	Virtue ethics (Agent)	Which level is the moral development of the project team? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	33	67	100	100
		Deontology (Action)	Does this decision comply with project-specific codes of conduct? Fail (0) – acceptable (50) – pass (100)	0	50	50	100
		Consequentialism (Results)	What is the expected outcome in terms of ethical supply chain of the project? Very unethical – 1 (20) – 2 (40) – 3 (60) – 4 (80) – 5 (100) – very ethical	20	60	80	100
1.8	Corporate (S Co.)	Virtue ethics (Agent)	Which level is the moral development of corporation? (Table V) Pre-conventional (33) – conventional (67) – post-conventional (100)	33	100	100	100
		Deontology (Action)	Does this decision comply with corporate codes of ethics and industry codes of ethics? Fail (0) – pass (100)	0	0	0	100
		Consequentialism (Results)	What is expected outcome in corporate reputation and image from this decision? Very unethical – 1 (20) – 2 (40) – 3 (60) – 4 (80) – 5 (100) – very ethical	20	60	80	100
*Total Score				233.2	654.2	852	900
Notes: *Calculation details; Decision 1: $1.4 \times (33 + 0 + 20) + 1.2 \times (33 + 0 + 20) + 1.8 \times (33 + 0 + 20) = 233.2$; Decision 2: $1.4 \times (67 + 0 + 60) + 1.2 \times (67 + 50 + 60) + 1.8 \times (100 + 0 + 60) = 654.2$; Decision 3: $1.4 \times (100 + 0 + 80) + 1.2 \times (100 + 50 + 80) + 1.8 \times (100 + 0 + 80) = 332$; Decision 4: $1.4 \times (100 + 100 + 100) + 1.2 \times (100 + 100 + 100) + 1.8 \times (100 + 100 + 100) = 900$; **Refer to Table VII. Analysis of alternative decisions							

Comments of the decisions

The most ethical decision is “D4: 10 per cent as CSR”. However, in reality, the officers of the host government might refuse the proposal. In that case, “D3: 5 per cent as bribery and 5 per cent as CSR and publicizing the full story after completion of the project” can be the alternative, as it will possibly secure the contract and ethicality can be enhanced at the later stage. In practice, the highest scored decisions may not be considered if the company needs to secure the profit for the survival of the company. The order and difference of ethicalness among possible decisions can be easily identified with the scoring system. The scoring also shows the strengths and weaknesses of each decision in respect of individual, project and corporate levels. Comparative analysis between different decisions can be conducted. For example, if D3 and D2 are compared from Table VIII, the differences of scores between these two decisions are 53 at individual level, 53 at project level and 20 at corporate level. This justifies that D3 is a more ethical decision than D2 at all the three levels. This scoring process provides a simple and practical approach to EDM for construction. The authors of this paper believe that this simplicity and practicality is

particularly relevant for construction ethics management, considering that most of construction practitioners are engineers, not philosophers or psychologists.

Limitation and discussion

The framework of ethics training in this paper suggests to include personality traits in ethics programmes for construction professionals. This will improve the quality of the training programme more efficiently and effectively, as it provides not only common courses but also customized individual courses based on their SOC personality traits. Compared to the commercially available ethics training programmes which mainly deal with legal issues to show immediate outcomes, the suggested framework is designed to resolve the root causes and provide short-term solutions for ethical issues. However, a long-term observation or survey needs to be included to evaluate the framework in detail. These will require to trace the improvement of ethicalness of course participants and, consequently, upgrade the framework to suit the rapidly changing environments.

The framework of EDM shows a good model to systematically assess the ethicalness of decisions related to construction projects. The adopted AAR model reflects not only the traditional consequentialism but also virtue ethics and deontology. In addition, the project-based approach is particularly relevant for the construction industry, as it is a project-based industry. Further, this score-based evaluation approach is more relevant to the engineers, as they are more familiar with calculations for assessments of engineering decisions. However, to confirm the generalizability of the framework, various and practical vignettes need to be developed and used in surveys with various levels of participants. These evaluations will justify the objectivity of the framework and, possibly, consequent upgrades will enhance the quality of the framework. In addition, to improve the judgement and objectivity of the decision makers, the ethics training programmes should be the prerequisite to implement the EDM process. The cycle of ethics training programme and EDM process will continuously upgrade and update the ethics management programmes for construction companies, reflecting not only theories and standards but also practicality and current ethical issues.

Conclusion

Construction is, in its nature, a unique engineering and business field, as its main product is “projects” which are often one-off. Ethics management in construction requires a different approach from business ethics. This paper has presented two main aspects of construction ethics management – ethics training and EDM. Two causality concepts have been applied to each aspect – SOC to ethics training and AAR to EDM. SOC reveals the causes of immature ethicality of individual employees at personal, interpersonal and socio-political levels, leading to a customized ethics training programme. AAR is combined with Kohlberg moral development theory and a stakeholder approach to produce the EDM framework. The framework not only deals with moral development of decision maker, project team and corporation, but checks the deontological (means) and consequential (ends) aspects of the decision.

For ethics training, the practicality of SOC in construction ethics training has been theoretically justified in this paper. Further, applications of this framework to construction professionals and consequent observations on the improvements of the course participants’ ethicalness should be studied as a future research. This will justify the practicality of the framework and help refine the framework. For EDM, generalizability and practicality of the framework can be further tested with broader surveys. These will include interview and/or questionnaire surveys with various levels of decision makers in construction projects. The research methodology should be carefully designed to reflect the reality of construction business ethics. Ethics is still a very sensitive area in the construction industry, and the project stakeholders might have different levels of ethical awareness. These future research works will reconfirm the value of causality concept in construction business

ethics, in respect of ethics training and EDM. Further, it is possible to apply and implement these SOC- and AAR-based ethics management programmes to other industries in which projects are part of the business activities. These include the shipbuilding industry, the aircraft manufacturing industry and project-oriented manufacturing industries.

In the example of construction EDM, Aristotle's "the reasonable middle ground" theory and cultural considerations have been introduced and applied to solve the given ethical problem. Alternatively, deontological or consequential concepts could have been applied exclusively. However, the authors of this paper believe that in the turbulent construction industry with extraordinary number of small- and medium-sized corporations, too strict or one-sided ethical principles are not suitable to solve the unexpected ethical dilemmas. The best solution can be achieved by optimizing the influencing factors to produce win-win results to the related parties and eventually to the society. This can be done by the suggested flexible and incremental progress of ethics management which sometimes requires negotiations with the reality, i.e. go one step backward, to go two steps forward.

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