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Key issues and challenges of risk management and insurance in China's construction industry

An empirical study

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Abstract

Purpose – The purpose of this study is to investigate the key issues and challenges in risk management and insurance in the Chinese construction industry and propose solutions to improve risk management.

Design/methodology/approach – The study is based on surveys which target people who have direct or relevant experience of risk management and construction insurance in China. Surveys were conducted by e-mail, mail and fax to selected clients, contractors (project director, project managers, and contract managers/administrators), insurers, brokers, consultants, claim advisors, and academics; and e-mails to Chinese researchers in the construction management field. Descriptive analysis is used for data analysis.

Findings – It is found that cultural considerations inhibit proper implementation of risk management in China's construction industry. It is also found that the perception and attitude of contractors play an important role in developing risk management. Accordingly, an organizational learning of a risk management model is designed and proposed as an organizational learning process through collaborative teamwork to improve risk management and create a learning organization.

Research limitations/implications – The major limitation is the sample size. A much larger sample size allows comparisons among different groups of contractors, regions, etc.

Originality/value – This empirical research identifies the real challenge of application of risk management in China's construction industry. It proposes a realistic organizational learning model through collaborative teamwork which could help Chinese contractors to improve their risk management.

Keywords Risk management, Insurance, Construction industry, Team working, China

Paper type Research paper

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1. Introduction

The rapid growth of the construction sector in China brings new challenges due to the risks involved in design and production. Chinese construction enterprises are experiencing

significant developments and structural reforms. Those companies were state-owned enterprises (SOE) whose risks, losses and profits were undertaken by the governments. The changing business environment in China's construction industry requires Chinese contractors to manage risks by themselves rather than relying on the government.

Risk management systems and procedures are not new. Managing risk involves creating awareness of uncertainty, qualifying the risks, managing the controllable risks, and minimizing the impact of uncontrollable risks by risk allocation/apportionment (Liu *et al.*, 2003). The ineffective implementations of risk management are often caused by:

- a lack of formalized risk management procedures, including risk identification, analysis and control (Tah and Carr, 2001);
- a lack of continuity of risk management in the different stages in the project life cycle, including conceive, design, plan, allocate, execute, deliver, review and support;
- poor integration between risk management and other key processes, including design, estimating, planning, production, logistics, cost analysis, manufacturing, quality assurance, reliability, schedule analysis, support (e.g. maintainability), and test and evaluation; and
- a lack of interaction among different parties, including clients, contractors, insurers, and suppliers.

Different parties involved in a project frequently have different perspectives on risks according to their own background and interests. Clients' needs and expectations define the scope and objectives of projects and the financial resource. Contractors take the major responsibility to deal with risks during construction process. They have to decide if they should retain, reduce, transfer or avoid risks. Contractors usually use three methods to transfer risk: through insurance to insurance companies; through subcontracting to subcontractor; and through modifying the contract conditions to clients or other parties (Chapman and Ward, 2003; Liu and Flanagan, 2005). Insurers not only provide insurance to help contractors to transfer risks, but also expertise to assist the contractors' risk management in recognizing potential risks and reducing the probability of such risks. The willingness of insurer to write an insurance coverage reflects favorably on insured's efforts at risk prevention (Flanagan and Norman, 1993; Williams *et al.*, 1998). The improved understanding and interaction among clients, contractors, and insurers will help in the effective management of risks that will benefit the construction industry (Choy *et al.*, 2006; Liu and Flanagan, 2005).

2. China's construction industry

China's construction market is complex, growing, and changing. The output of the construction industry has increased by nearly 60 times in the past 25 years (Figure 1). The change involves new patterns of employment, the use of specialist sub-contractors, market competition, selection based upon price, and the need for enterprises to make profits. It requires the industry to manage knowledge and create enterprises that understand risk.

China had a centrally planned economy and the government usually assigned construction work to construction enterprises in the past. Since, opening up in 1978, economic reforms have changed the economic and social systems. China's construction

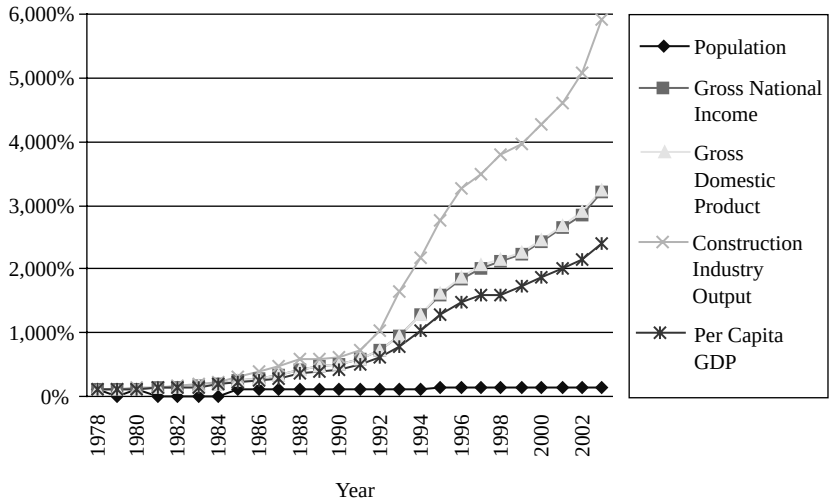

Figure 1.
Economic Development of China, 1978-2003

Notes: Data in value terms in this table are calculated at current prices. No population data in1979 and 1981-1984

Source: National Bureau of Statistics of China

industry starts to promote project management and "responsibilities system". The state-owned sector still plays an important role in China's economy. The SOE dominate about half of the market and still enjoy the monopolistic environment by regulations and tariffs. This leads to their short-term views on construction management. Many SOEs are not concerned about risk management. In order to become globally competitive, China actively seeks out foreign involvement. After China officially entered the World Trade Organization (WTO) on 11 December 2001, the limitations for foreign enterprises have gradually been lowered. Out of the top 225 international contractors, 140 have started business in China by 2003. The inflow of foreign companies has promoted the reform of China's construction industry. It also helps Chinese construction companies gain a better understanding of international practices especially in the management field. The government uses a new strategy called "way out" to encourage Chinese contractors to join the international markets. The SOEs have to be competitive in the international market place; when building overseas they must manage risks and win work based upon price and value for money.

Moreover, increased expectations from clients bring new procurement, contract and construction methods to China's construction industry. It brings a large number of risks to Chinese contractors. The complex and dynamic characteristics of construction projects require contractors to use risk management, a proactive approach to deal with risks, instead of traditional negative attitude to risks (Lubitz and Wickramasinghe, 2006). Some of the risks include safety, quality, payments delays, poor estimating and unreasonable contract conditions.

3. The challenges

Since, the revival of China's construction market from 1990, there has been considerable development in the construction and insurance industries. China's construction industry

has been keen to learn from developed countries about knowledge and practice of project management. In the past, the project management system has been applied with the characteristics of Chinese culture and political ideology. However, risk management and construction insurance has not been given enough attention. The application of risk management to China's construction industry (Shen, 1990) was first proposed 15 years ago. But the knowledge and practice of risk management is still very limited.

3.1 Knowledge

The lack of knowledge retention and communication has always been a serious problem for the construction industry. The traditional approach to managing the risk from projects has utilized the valuable assets of experience and judgment. However, there is no tradition in China of employing risk management and insurance of any type. The lack of experience makes it very difficult to change Chinese contractors' and clients' attitude towards construction insurance and risk management. At present, Chinese contractors and clients do not fully understand or appreciate their benefits. Even if they purchased insurance polices, this is mostly to comply with standard contracts, or construction laws instead of their own interests of mitigating construction risks.

3.2 Attitude

Contractors do not have a realistic attitude to construction risks, which emerge from the centrally planned economy system. Investment in many large and medium projects still comes from governments. The governments own the projects and are responsible for any losses. In this system, risk management and loss preventions are not a priority. Furthermore, insurance premiums are often not included in project budgets. There is no motivation for contractors to transfer risks to insurers. Because the government will reimburse any losses incurred.

3.3 Legal system

China has promulgated a lot of laws and regulations to make the construction industry more efficient, and to regulate the construction market to provide the legal environment of construction insurance. The Construction Law and Insurance Law are two basic laws to support construction insurance. Requirements from laws and standard construction contracts, e.g. FIDIC, are main drivers for purchasing construction insurance. However, there are two problems with legal systems in China's construction and insurance legal system: fragmentation of regulatory authorities and ambiguity in legal drafting. The relevant legislations for the implementation of construction insurance system are lacking. In developed countries, the implementation of many insurance policies has been made compulsory by laws with the supplement of some specialized insurance companies, bond companies and finance institutions. In China, the Construction Law was put into effect on March 1, 1998. In Article 48 of the law, it is clearly stipulated that contractors must insure workers involved in dangerous jobs and pay the insurance premium. This is the only stipulation on compulsory insurance in construction regulations and laws.

3.4 Construction insurance market

The construction insurance products and service are limited, and few insurance companies can provide advice on risk management in China. Construction insurance is

new to the domestic market. Insurance companies see it as an opportunity but they lack depth of experience leading to unreliability. Moreover, there are two issues in calculating premium of construction insurance. One is ill defined, over-extended coverage at inadequate premiums due to competition among insurance market. It results in difficulty for insured to be indemnified by insurers in a major calamity. Insurers cannot transfer risks to the international reinsurance market due to their low premiums. They then have to take all risks, which they cannot afford. The other is very high premium charged by insurers because of their cautious approach and the lack of record of construction insurance. The insurers do not know the appropriate premium rate for construction risks. Consequently, they charge more to cover the risks and to ensure profitability.

Quality and safety problems and payment delay require China's construction industry to employ risk management in their practice. China's construction industry has often been accused of short-term goals with emphasis on higher margins and profits. Lack of investment in people, processes and technology is costing the industry. Chinese construction managers had little knowledge or understanding of risk management.

4. Research methodology

In order to achieve the objective of analyzing the key issues and challenges facing risk management and the major barriers to risk management and construction insurance in China's construction industry, the survey was designed to investigate the attitude of key participants and the development of the relevant knowledge and service (Dwivedi *et al.*, 2006; Li *et al.*, 2004, 2006). Although there are many probability sampling techniques, there are often occasions when researches find it difficult or undesirable to choose their sample on the basis of probability sampling. Therefore, this research turns to forms of non-probability sampling as the basis for selecting the sample. Surveys sent 150 copies of questionnaire by e-mail:

- mail and fax to selected clients, contractors (project director, project managers, contract managers/administrators), insurers, brokers, consultants, claim advisors, and academics; and
- to Chinese researchers in construction management field.

It mainly targets clients, contractors, insurers, brokers, and researchers, who have direct or relevant experience of risk management and construction insurance in China. A total of 41 responses were received. After excluding four returns, which failed to satisfy the requirements of the survey due to no relevant experience more than three years, 37 questionnaires, comprising of 17 from contractors, 3 from clients, 2 from insurers, 8 from researchers, and 7 from others, were analysed. The respondents come from 6 provinces (Heilongjiang, Henan, Jiangsu, Zhejiang, Hebei and Yunnan) and 3 centrally administrated municipalities (Beijing, Shanghai and Tianjin). They cover different geographic areas of operation; the broad range of experience in market; the size of companies, the experience in international market, qualifications, and types of contractors/subcontractors.

5. Results and discussions

5.1 Perception

Of respondents, 34.29 percent believe that contractors' attitude is the most important factor to influence the development of risk management in China's construction

industry (Figure 2). Culture plays an important role in influencing the development of risk management and construction insurance in China. Chinese personality used to be very conservative. Most are traditionally and typically risk takers. They usually refuse to spend a small amount extra money for transferring risks to insurers in future. Because Chinese will not pay for prospective accidents and just bet their luck for the best outcome like gambling. National culture determines the organizational culture, which is very important in implementing risk management. Surprisingly, the general weight of the cost of risk management is 3.40 (5 is full weight), which is the result of calculation of survey data. Usually, it is believed that practitioners are very cost sensitive. By contrast, in reality, practitioners care more about if they can get such knowledge and expertise easily and high-quality service rather than its price.

Of respondents, 86 percent agree that risk management skills are important for project management activities. However, risk management has not developed as fast as project management in China, and is only a concept in China's construction industry. Practitioners are still hampered by its cost and inertia of the old system. However, Chinese contractors are beginning to realise risk management is a primary key to project success, and understand that it is imperative to eliminate or minimise construction risks. Of respondents, 83 percent recognised the benefits of risk management, that the expertise of risk management can improve the competitiveness of China's construction industry. Its development and implementation have gained a lot interests from practitioners and researchers. In addition, the awareness of risk management and construction insurance is strong in developed area and large projects in China. Insurance service is widely used in such projects in China's East coastal region.

There are extreme divergences in recognising the cost of risk management. Value/cost of risk management is the most important factor to evaluate risk management performance. In addition, 48 percent of respondents do not regard risk management as the considerable extra cost and time burden for the whole project management, because they believe that the cost of risk management is minor compared with the potential loss.

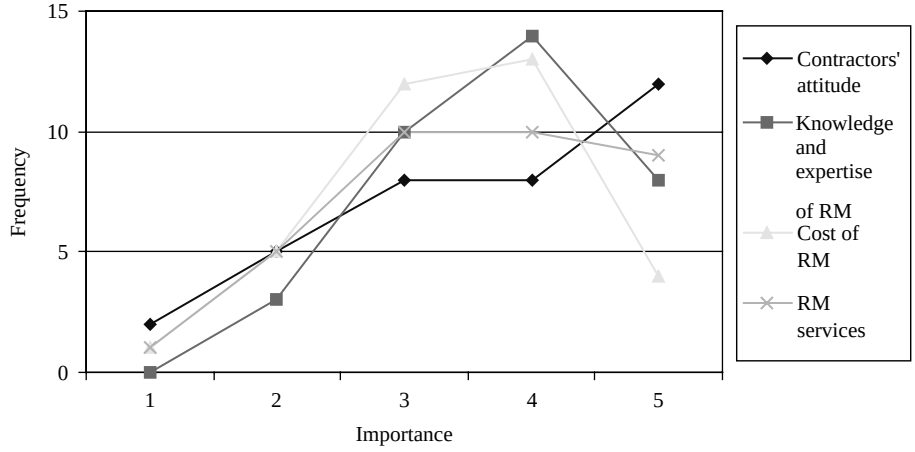

Figure 2.
Factors influence the development of risk management in China's construction industry

The issues relating to perception and culture are often far more challenging than the technology related issues because the attitude is very difficult to change. The hardest part of risk management is not finding the techniques or the tools to analyze risk and uncertainty, but accepting that life is uncertain and that it is better to grasp it rather than ignoring it (Flanagan and Norman, 1993). Knowledge and techniques can be learnt very quickly and easily, but the awareness and attitude to risks are very difficult to change in China. Its problem is ignorance of risk management. Cultural change is very important for implementing risk management philosophies for most Chinese contractors. Cultural aspects not only strongly affect motivation and commitment of project team members, but also influence the relationship between parties involved in the industry. Risk culture in China has been very much influenced by its unique culture, social system and historical background. The incoming of western culture also influence the attitude of Chinese practitioners. With its great development and accession to the WTO, China's construction industry is no longer separated from the international market. Inevitably, international interaction would bring changes in the original construction activities in the industry.

5.2 Knowledge

Risk management is not separated from other knowledge. Of respondents, 48.57 percent highlight contract management as the most important factor (Figure 3). It means that Chinese practitioners have realised that risks can be defined and shared in contract. And good contract management can allocate responsibilities and liabilities among parties and therefore avoid conflicts.

Chinese contractors need the knowledge and expertise of risk management to manage construction projects urgently. This positive attitude may lead to acceptance of risk management by China's construction industry. It is criticised for a short-term view on business development, with little interest in enhancing their long-term competitiveness. To achieve a step improvement in its overall performance, the construction industry needs to develop a new culture that focuses on delivering better value to the customers on a continuous basis, which can be established by successful

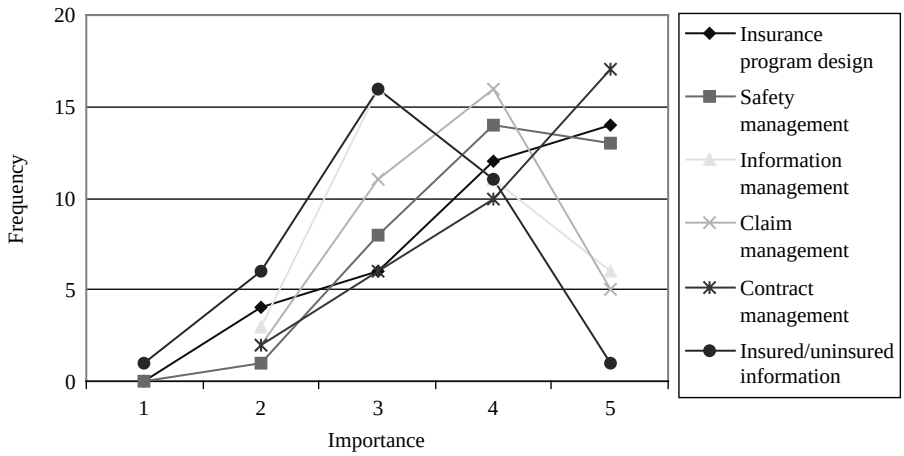

Figure 3.
The contribution of knowledge or experience to construction risk management

risk management. Universities and professional associations can help industry and governments to cultivate a positive construction culture. Totally 121 universities in Chinese mainland, e.g. Tianjin University, Tsinghua University, and Tongji University, offer construction management course. They build a networking between academia and industry and can obtain feedback from professional associations and governments as well to ensure education to meet the changing needs of the industry. Industry learning in China can be gained by the co-operation of construction companies, universities, and professional/industrial associations.

5.3 Practice

As shown in Figure 4, 58.33 percent of respondents think statutory system gap is very important to influence the development of construction insurance. China's construction authorities should set insurance coverage compulsory in relevant laws and regulations, e.g. the Construction and Insurance Laws. For example, a design institute is supposed to be responsible for their own design errors. However, they cannot afford the huge loss caused by design risks. Therefore, it is recommended to define clear responsibilities and risks of each party or make compulsory duties, e.g. design liability insurance. About 90 percent of respondents believed that works contract should include strict and clearly defined insurance terms. Contracts can be modified to provide a favorable environment of risk management. Contractors and clients are more sensitive to time control rather than cost control. Safety disasters happened frequently in China's construction industry, because most workers and some managers do not have a proper education or training of safety management. On the other hand, China is regarded as an "international division of labor" because of the cheap price of labor force. It also caused less attention to safety from contractors because if injuries to workers happened, contractors compensate limited money to workers.

Of respondents, 62 percent agree or strongly agree that contractors had a rather low ability of risk management. Contractors always regard profit as the most important objective and care less about quality of construction projects. The diversity of contractors' qualifications affects the implementation of project management.

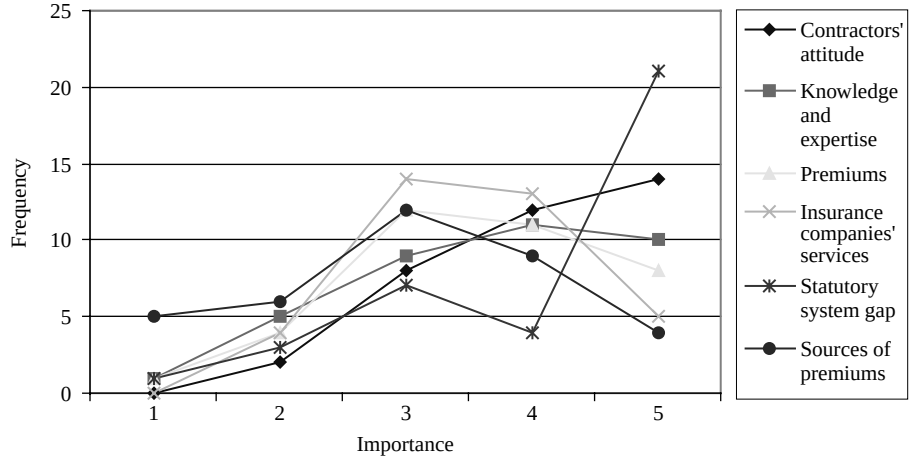

Figure 4.
Factors influence the development of construction insurance in China's construction industry

The construction insurance program is often involved in the following insurance policies (popularity): personal accident and workers' compensation (85 percent), third party (55 percent), contractors' all risks (50 percent), employer's liability (40 percent), marine (30 percent), erection all risks (25 percent), professional liability/indemnity (10 percent), public liability (5 percent), liability for ten years/latent defects (5 percent), machinery breakdown (5 percent), and equipment (5 percent). In fact, most insurance policies are not popular in China and are only employed in some international projects. Compared with the fast development of China's construction industry, the proportion of contractors having insurance coverage is still quite low. The ratio is only 30 percent Shanghai – the most advanced insurance market in China. There are three reasons:

1. Unreasonable investment mechanism: many projects are still invested by governments. When risks occur, government would cover all damage.
2. Unreasonable cost management mechanism: there is no clear funding source of insurance premium in China.
3. Chinese contractors always believe that construction insurance would increase construction cost and make less profit.

Most commercial and state policy-related banks do not require insurance.

5.4 External service for contractors

Of respondents, 79 percent do not regard insurance premium as an expensive charge against risks. Respondents thought that the real trouble was the difficulty in claims. About 76 percent respondents believe the claim service is not standard. The fear and distrust of claims discourage contractors to buy insurance.

Insurance companies can help contractors on risk management by providing specialised services, e.g. risk survey. In fact, the effectiveness of risk management can be measured in terms of savings in insurance premiums. About 81 percent respondents believed that underwriters should encourage contractors to improve their risk management through insurance premium discount. Poor understanding between insurers and contractors highlights a need for developing a culture of collaborative teamwork.

Despite the development and the promising future of the Chinese insurance industry, the shortage of experienced insurance personnel in China hampers the industry's expansion ambition. The supply of appropriate risk management experts dealing with insurance issues is lagging behind the increasing demand, both in the domestic and international market. The knowledge and practice of risk management are vital to improve the performance of Chinese contractors.

6. Proposed solutions

The result of the survey indicates that the practice and knowledge of risk management of Chinese contractors is still low. Risk management is not a priority in management strategy. Therefore, organizational learning as a solution is recommended to improve their risk management (Tah and Carr, 2001). The long-term effectiveness of organizations that compete through knowledge depends crucially on their organizational learning.

The high degree of fragmentation of industry structure and work processes, adversarial relationships among project participants, and lack of communication are

bottlenecks for China's construction industry to achieve further improvement. Therefore, there is an urgent need for collaborative teamwork among government, the construction and insurance industries, and academia to improve the competitiveness of the construction industry (Hsieh *et al.*, 2006; Hung *et al.*, 2005; Martz *et al.*, 2006; Wu *et al.*, 2006). All these parties should work together to build a favourable learning environment for contractors. Mutual co-operation can improve the performance or achievement of all of the participants. The construction industry can learn from best practice of risk management from the insurance industry, expectations and understanding from governments, and knowledge from academia (Lin and Tseng, 2005, 2006). This research firstly brings collaborative teamwork to the organization learning process in the construction industry and may promote the future collaborative working in business.

The organizational learning framework of risk management for Chinese contractors is presented in Table I. The process does not end once a program has been implemented. It is a dynamic process, and impacted by internal and external factors (Hyde, 2006). Good governance requires that appropriate tools and regular reviews be put in place to gauge the efficacy of the program. It should bring about organizational culture change, a top-down approach, and can make the change an iterative process.

7. Conclusion

This study identifies that the biggest barrier to developing risk management is an unsupportive culture in China's construction industry. There is a general reluctance to

Actions	Action A: process launching	Action B: implementation	Action C: evaluation
Objective	Organising and defining the OLRM strategy	Designing codes of the OLRM process	Evaluating the implementation of OLRM model and improving its process
Main steps	*A1* Define risk management and confirm the perspectives from contractor and other parties interested *A2* Define their responsibilities in organizational learning through collaborative teamwork *A3* Ensure that the learning strategy is fully provided for in the corporate strategy plan and communicated to all parties involved *A4* Prepare a preliminary brief based on the level of risk perception *A5* Establish an OLRM team and appoint a "knowledge manager"	*B1* Organization and control *B2* Who *B2.1* The team *B2.2* Risk manager *B2.3* Individuals *B3* Knowledge sharing and managing *B3.1* Documentations *B3.2* Risk management information systems (RMIS) *B3.3* Knowledge sharing practices *B4* Process of risk management *B4.1* Risk identification *B4.2* Risk evaluation *B4.3* Risk management	*C1* Evaluate the level and perception of risk management *C2* Review the OLRM process and write an "OLRM close-down report" *C3* Using the OLRM review reports, an assessment will highlight that the perception of risks can be improved by OLRM process *C4* Model updating

Table I.
Procedures of organizational learning of risk management

implement risk management in China's construction industry because of the lack of experience and expertise demonstrated by the results of the survey. Without knowledge and expertise, contractors cannot recognise the importance and benefits of risk management. The low perception of risks can only be improved by changing the enterprise culture. It is necessary that Chinese contractors accept the concept of risk management and implement the techniques of risk management. Practitioners' attitude is the most important factor influencing the development of risk management in China's construction industry. There is a lack of co-operation between the insurance industry and construction industry. Contractors and insurers should improve the understanding of risk and share their expertise in risk management. Organizational learning should be a crucial part of an integrated risk management process. The organizational learning of risk management is a learning framework designed to help Chinese contractors improve their knowledge and performance of risk management. The crucial factor for China's contractors to improve their competitiveness is to convert the advanced knowledge to their own knowledge through organizational learning.

References

Chapman, C. and Ward, S. (2003), *Project Risk Management: Processes, Techniques, and Insights*, 2nd ed., Wiley, New York, NY.

Choy, C.S., Yew, W.K. and Lin, B.S. (2006), "Criteria for measuring KM performance outcomes in organisations", *Industrial Management & Data Systems*, Vol. 106 No. 7, pp. 917-36.

Dwivedi, Y.K., Choudrie, J. and Brinkman, W.P. (2006), "Development of a survey instrument to examine consumer adoption of broadband", *Industrial Management & Data Systems*, Vol. 106 No. 5, pp. 700-18.

Flanagan, R. and Norman, G. (1993), *Risk Management and Construction*, Blackwell Science, Oxford.

Hsieh, C.T., Lai, F.J. and Shi, W.H. (2006), "Information orientation and its impacts on information asymmetry and e-business adoption: evidence from China's international trading industry", *Industrial Management & Data Systems*, Vol. 106 No. 6, pp. 825-40.

Hung, Y.C., Huang, S.M., Lin, Q.P. and Tsai, M.L. (2005), "Critical factors in adopting a knowledge management system for the pharmaceutical industry", *Industrial Management & Data Systems*, Vol. 105 No. 2, pp. 164-83.

Hyde, P. (2006), "Managing across boundaries: identity, differentiation and interaction", *International Journal of Innovation and Learning*, Vol. 3 No. 4, pp. 349-62.

Li, B.G., Riley, M.W. and Hsieh, C.H. (2004), "Assessing customer satisfaction in parcel delivery industry: an empirical study among university customers", *International Journal of Services and Standards*, Vol. 1 No. 2, pp. 172-92.

Li, B.G., Riley, M.W., Lin, B.S. and Qi, E.S. (2006), "A comparison study of customer satisfaction between UPS and FedEx: an empirical study among university customers", *Industrial Management & Data Systems*, Vol. 106 No. 2, pp. 182-99.

Lin, C.H. and Tseng, S.M. (2005), "The implementation gaps for the knowledge management system", *Industrial Management & Data Systems*, Vol. 105 No. 2, pp. 208-22.

Lin, C.H. and Tseng, H.J. (2006), "Identifying the pivotal role of participation strategies and information technology application for supply chain excellence", *Industrial Management & Data Systems*, Vol. 106 No. 5, pp. 739-56.

Liu, J. and Flanagan, R. (2005), "Insurance and construction project risks", *Proceedings of the First Annual Built Environment Education Conference, London*.

Liu, J., Flanagan, R. and Li, Z. (2003), "Why does China need risk management in its construction industry", *Proceedings of the Nineteenth Annual Conference of the Association of Researchers in Construction Management*, University of Brighton, Brighton.

Lubitz, D.V. and Wickramasinghe, N. (2006), "Dynamic leadership in unstable and unpredictable environments", *International Journal of Management and Enterprise Development*, Vol. 3 No. 4, pp. 339-50.

Martz, W.B. Jr, Neil, T. and Biscaccianti, A. (2006), "Exploring entrepreneurial decision-making strategies", *International Journal of Innovation and Learning*, Vol. 3 No. 6, pp. 68-672.

Shen, L.Y. (1990), *Application of Risk Management to the Chinese Construction Industry*, University of Reading, Reading.

Tah, J.H.M. and Carr, V. (2001), "Knowledge-based approach to construction project risk management", *Journal of Computing in Civil Engineering*, Vol. 15, pp. 170-7.

Williams, C.A., Smith, M.L. and Peter, C.Y. (1998), *Risk Management and Insurance*, McGraw-Hill, Boston, MA.

Wu, W.Y., Wu, Y.J. and Lo, Y.J. (2006), "The impact of governance mechanisms on interfirm learning and relationship performance", *International Journal of Innovation and Learning*, Vol. 3 No. 6, pp. 673-92.

Further reading

Lai, F.J., Zhao, X.D. and Wang, Q. (2006), "The impact of information technology on the competitive advantage of logistics firms in China", *Industrial Management & Data Systems*, Vol. 106 No. 9, pp. 1249-71.

Tafti, M.H.A. (2005), "Risks factors associated with offshore IT outsourcing", *Industrial Management & Data Systems*, Vol. 105 No. 5, pp. 549-60.

Appendix. The questionnaire of risk management and construction insurance in China

You are invited to participate in this survey of the construction industry in China. It will provide a picture of trends, developments, issues, concerns and opportunities in construction insurance in China. The research is seeking the opinions of clients, contractors, sub-contractors, insurers, brokers and researchers. The survey will investigate the key issues and challenges facing risk management, as well as the major barriers to risk management and construction insurance in China's construction industry.

Part 1: Background

Name: Position:
Company: Address:
Phone: E-mail:

Your experience related to construction/insurance industry
() 0-5 years () 6-10 years () 11-15 years () 16-20 years () 20+ years
Years in market of your company
() 0-5 years () 6-10 years () 11-15 years () 16-20 years () 20+ years
Current number of employees (for contractors/sub-contractors)
() 1-50 () 51-100 () 101-1,000 () 1,001-5,000 () 5,001-10,000 () 10, 000+
Number of overseas countries currently served (for contractors/sub-contractors)
() 0 () 1-3 () 4-10 () 10+
Qualification of contractors/sub-contractors
() The first-class () The second-class () The third-class () The fourth-class
() Other, please specify ____

Types of companies
() State-owned company () Private company () Foreign company () Joint Venture company
() Other, please specify ____

Part 2: Research questions

1. To what extent can the following factors influence the development of risk management in China's construction industry? (Please give a weight with 1 for the least important to 5 for the most important)

()1 () 2 () 3 () 4 () 5 The attitude of contractors
()1 () 2 () 3 () 4 () 5 The availability of knowledge and expertise of risk management
()1 () 2 () 3 () 4 () 5 The cost of risk management
()1 () 2 () 3 () 4 () 5 The availability and quality of risk management services
Other, please specify ____

2. What is the most difficult part in risk management implementation in China's construction industry? (Tick one)
() Risk identification
() Risk analysis
() Risk control
Other, please specify ____

3. What do you think is the most important factor in evaluation of risk management performance practically?

4. To what extent can the following factors influence the development of construction insurance in China's construction industry? (Please give a weight with 1 for the least important to 5 for the most important)

()1 () 2 () 3 () 4 () 5 The attitude of contractors
()1 () 2 () 3 () 4 () 5 The availability of knowledge and expertise
()1 () 2 () 3 () 4 () 5 Premiums
()1 () 2 () 3 () 4 () 5 The quality of insurance companies' services
()1 () 2 () 3 () 4 () 5 The gap in statutory system
()1 () 2 () 3 () 4 () 5 The funding sources of construction insurance premiums
Other, please specify ____

5. What is the most important drive to purchase construction insurance? (Tick one)
() Clients' requirement
() Contractors' own interests (e.g. cost control, risk transferring, etc.)
() Construction standard contract' requirement
() Legal requirement
() Bank's requirement
() Other, please specify ____

Question 6 is designed for clients/contractors/sub-contractors:
6. Which of the following insurance policies have your projects used?
() Contractors' all risks (CAR)
() Erection all risks (EAR)
() Third party (TP)
() Employer's liability policy (EL)
() Public liability (PL)
() Liability for ten years/latent defects insurance (LD)
() Professional liability/indemnity insurance (PI)
() Marine insurance
() Machinery breakdown (MB)

() Personal accident policy/workers' compensation insurance (WC)
() Other, please specify ____

7. To what extent can the following knowledge or experience help to manage construction risks effectively? (Please give a weight with 1 for the least important to 5 for the most important)
()1 () 2 () 3 () 4 () 5 Construction insurance program design (e.g. underwriting process)
()1 () 2 () 3 () 4 () 5 Safety management
()1 () 2 () 3 () 4 () 5 Information management (experience, loss cost, etc.)
()1 () 2 () 3 () 4 () 5 Claim management
()1 () 2 () 3 () 4 () 5 Contract management
()1 () 2 () 3 () 4 () 5 Insured/uninsured information
Other, please specify ____

8. What is the general attitude towards construction risks in China? Why?
() Contractors/sub-contractors carry a certain risk and include a price for it in their tenders. Why? ____
() Clients carry as many risks as possible. Why? ____
() Other, please specify ____

9. Do you think there are any other better solutions than construction insurance to transfer or alleviate construction risks?
() No
() Yes. What are they? ____

For questions of 10 ~ 28, do you agree with the following arguments (see Table AI)?

Do you agree with the following argument?	SD	DA	NA	AG	SA	DK
10. Contractors' proficiency in risk management plays an important role in project management activities						
11. Chinese contractors need risk management knowledge and expertise in managing construction projects urgently						
12. Risk management can effectively protect the contractors' interests						
13. Risk management will be involved in considerable extra cost of management expense and time						
14. Construction insurance can protect contractors' interest effectively						
15. Most insurance companies, who do construction insurance business in China, understand the needs of contractors						
16. Most insurance companies, who do construction insurance business in China, are qualified						
17. It is difficult for Chinese contractors to design a construction insurance program						
18. When contractors plan to purchase construction insurance program, they need third party's (e.g. agents, brokers, etc.) help to provide information and knowledge						
19. In China, insurance companies are familiar with the background of construction companies						
20. In China, insurance companies are familiar with the background of construction projects						
21. In China, contractors are familiar with the background of insurance companies in their area						
22. Construction insurance against risk is expensive due to high premiums in China						

(*continued*)

Table AI.

Do you agree with the following argument?	SD	DA	NA	AG	SA	DK
23. The services of claim from insurance companies in China are standard						
24. Insurance claims are difficult and wordings are complicated, therefore contractors have to turn to an intermediary (e.g. agents, brokers, loss adjusters)						
25. Contractors can retain the premium and manage the risks by themselves effectively						
26. A contract of works in China should contain strict and clearly defined insurance terms						
27. Insurance companies in China could not provide risk management service effectively even at extra charge						
28. Underwriters should give contractors premium discount in consideration of construction companies' good risk management practice						

Notes: SD = strongly disagree; DA = disagree; NA = neutral; AG = agree; SA = strongly agree; DK = do not know

Table AI.

Do you have any comments on this interview in general?

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