

Chapter 7.7

A Variable Precision Fuzzy Rough Group Decision-Making Model for IT Offshore Outsourcing Risk Evaluation

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ABSTRACT

Risks evaluation is critical for the success of IT offshore outsourcing. Based on fuzzy group decision-making (FGDM) and variable precision fuzzy rough set (VPFRS), this article proposes a new integrated model, variable precision fuzzy rough group decision-making (VPFRGDM), to evaluate the risk in IT offshore outsourcing. This model can improve the capability to handle potential errors fairness and efficiency of risk evaluation, and is verified by a numerical case.

INTRODUCTION

Offshore outsourcing is impacting many industries especially in information technology (IT). According to the Meta Group IT consulting firm's forecasting, the annual offshore outsourcing rate will continue to grow at 20%, reaching \$10 billion in 2005 (Rottman, 2006). Offshore outsourcing brings up opportunities and changes for both companies and many countries. Its benefit, as literally and practically illustrated, includes substantial cost savings, increased productivity, better

access to new technology, and higher quality of service. However, there have been reported a lot of unsuccessful cases, for example, cost exceeding, deterioration in service quality, or even cultural conflict, and so forth. The Gartner IT consulting firm estimates a 50% failure rate for offshore outsourcing initiatives (Rottman, 2006).

To some extent, IT offshore outsourcing is more risky than IT outsourcing. IT offshore outsourcing inherits naturally risks of IT outsourcing, such as information dissymmetry, high dependency on service providers, and contains some unique characteristics. The first one is cost, as IT offshore outsourcing means much higher expense on selecting providers and instructing transaction, which might even offset the expected savings from outsourcing; the second one is culture, as IT offshore outsourcing involves potential conflict in region, moral, or even history between two countries in addition to differences between two company styles. Moreover, there might be more risk and difficulty in policy, law, security, and intellectual property, and so forth. The complication mentioned results in more difficulty to achieve objectives of cost, quality, and schedule. In order to guarantee the success of offshore outsourcing, risks need to be evaluated and managed more precisely due to the unique challenges posed by geographical, cultural, and other differences.

IT offshore outsourcing risk attracts much research interest and is discussed at great lengths. Rottman (2006) suggests that both the people involved in offshore projects and the projects themselves must be treated differently from internally developed projects, and instructs to establish processes that ensure successful delivery and protection of its intellectual property. Verhoef (2005) identifies the most prominent quantitative input needed to close goal-driven outsourcing deals, forwards five executive issues enabling rational decision making concerning cost, duration, return, financing, and especially risk aspects of outsourcing. Doh (2005) suggests that international labor and environmental

standards and corporate codes of conduct could mitigate some of the most intense concerns raised about offshoring. Kliem (2004) believes that the risks should be managed throughout the life cycle of the offshore outsourcing projects to achieve benefits, and provides a framework of risks associated with outsourced projects and a process that can be used to develop a matrix of risks and controls appropriate for the project's objectives. Qu and Brocklehurst (2003) outline a framework for analyzing transaction costs and uses the framework for pinpointing where China is unable to compete with India. Nair and Prasad (2004) utilize a SWOT analysis technique for identifying a potential IT offshore outsourcing location. Carmel and Nicholson (2005) examined the factors using transaction cost theory (TCT) three stages, identify nine mitigation approaches to reduce transaction costs for small firms. Bahli and Rivard (2005) validated measures of risk factors based on transaction cost theory, which are adopted in this article.

The papers mentioned focus mainly on identification, analyzing framework, prioritization, and management planning of IT offshore outsourcing risks; yet further emphasis is needed on quantitative methodology for analyzing and assessing risks in order to support decision-making in uncertain environments. As literally and applicably demonstrated, IT offshore outsourcing risk evaluation is a complex, unstructured, or semi-structured decision-making process involving linguistic assessment and ambiguity. Additionally, IT related technology, product, and service evolve too fast for any decision-maker to handle. Consequently, a synthetic methodology is needed, which is able to utilize both experts' knowledge and historical data, able to handle the ambiguity involved in data evaluation, able to eliminate bias of possible personal preference or discrimination, and the capability to handle potential errors..

FGDM is not only fit for handling the ambiguity involved in data evaluation and the vagueness of linguistic expressions (e.g., very high, high,

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