Chapter 6

ERP Software Selection Based on Intuitionistic Fuzzy VIKOR Method

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ABSTRACT

This chapter uses intuitionistic fuzzy VIKOR (IFVIKOR) for the application of ERP software selection. First, priority values of criteria in ERP software selection problem have been determined by using the judgments of the experts. IFWA operator is utilized to integrate the judgments of the experts about the weights of criteria. Then, the result of the IFVIKOR can be employed to define the most appropriate ERP alternative in uncertain environment. Intuitionistic fuzzy numbers are presented in all phases in order to overcome any vagueness in the decision-making process. The final decision depends on the degree of importance of each decision so that wrong degree of importance causes the mistaken result. The researchers generally determine the degrees of importance of each decision makers according to special characteristics of each decision maker as subjectivity. In order to overcome this subjectivity in this chapter, the judgments of decision makers are degraded to unique decision by using the importance degree of each expert. There is no study about ERP software selection using IFVIKOR.

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INTRODUCTION

An enterprise resource planning (ERP) system is a business process management software that combines a number of modular software implementations to meet all the needs of a firm. An ERP system is the knowledge framework of a firm that automates and combines whole business tasks like purchase, sales, inventory control, human resource, production planning and finance. Applications of ERP systems are one of the most important investment projects due to the difficulty, high cost and adaptation risks. Firms have spent billions of dollars and utilized many amounts of man-hours for installing detail ERP software systems (Yusuf et al., 2004). Unprecedented market competition has impressed whole facets of business environment with the conclusion that firms need to decrease total costs, be more sensitive to customer requirements and reduce lead times. To overcome these challenges, novel software systems known in the business environment as ERP systems have surfaced in the market targeting primarily large scale organizations (Karsak and Ozogul, 2009). Any ERP software in market cannot fully meet the needs and expectations of companies, because every company runs its business with different strategies and goals. Thus, to increase the chance of success, management must choose appropriate software that most closely suits its requirements (Ayağ and Özdemir, 2007). Therefore, ERP software selection is an extremely serious and difficult decision making problem for managers. Many firms apply their ERP software hastily without exactly understanding the inclusions for requirements of their business strategies and goals. The conclusion of this hurry approach is the failure in ERP software selection that leads to the failure of project or firm performance will get weakened (Liao et al., 2007).

This chapter consists of five sections. The second presents the related literature review. The third section consists of methods that used IFWA operator and IFVIKOR in ERP software selection. Section four is related with ERP software selection application of the developed decision making approach. The conclusion of this chapter is presented in Section five.

BACKGROUND

Lee et al. (2004) studied on SWOT based ERP software selection. Wei et al. (2005) defined AHP model which enables a firm to determine the factors of ERP software selection. Liao et al. (2007) introduced a similarity degree based algorithm about ERP systems, which may be defined by various linguistic statements. A linear programming model is set up for deciding the most convenient ERP software. Ayağ and Ozdemir (2007) adopted the fuzzy extension of the analytic network process (ANP) based intelligent approach to select the most convenient ERP software.
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