Chapter 12
The Application of Fuzzy Performance Modelling Procedures in Extended Enterprise Performance Measurement

Jian Zhou
Tsinghua University, China & Electronic Technology Information Research Institute, China

Paul Folan
National University of Ireland, Ireland

Harinder Jagdev
National University of Ireland, Ireland

Jim Browne
National University of Ireland, Ireland

ABSTRACT
The concept of performance, as it is measured and evaluated, is undergoing a transformation in modern business organisations, so that partnering companies who form enterprise networks that work together across the value chain, can apply evolving performance measurement structures that more accurately capture value chain realities. In this chapter an Extended Enterprise (EE) performance measurement system that can theoretically present models, measures and data from all aspects of the participating companies’ functions in an EE is presented; together with the innovative development of a fuzzy-based performance modelling method, which acts as a supplement to the original procedural measurement framework, enabling the development of a system of performance measurement that is of greater relevance to both intra-organisational and inter-organisational levels, and which goes beyond current efforts to achieve greater reliability in the selection and implementation of performance measures.

DOI: 10.4018/978-1-60566-346-3.ch012
INTRODUCTION

The concept of performance, as it is measured and evaluated, is undergoing a transformation in modern business organisations. Globalisation, environmental issues, radical business and organisational structures have brought significant pressures to bear upon companies, who, in an attempt to address these pressures, are forming enterprise networks that work together across the value chain in order to meet more complex customer needs (Browne, 1995). The Extended Enterprise (EE) is a formation of closer co-ordination in the design, development, costing and the co-ordination of the respective manufacturing schedules of co-operating independent manufacturing enterprises and related suppliers (Jagdev & Browne 1998); and is the consequent result of a move away from the traditional view of manufacturing companies with clear boundaries, limited relationships with other companies and a focus on internal efficiency and effectiveness only (Browne & Zhang, 1999).

Performance Measurement (PM) has also begun to evolve to combat these new organisational realities, as the external environment is becoming identified as the next frontier of PM. In the current literature upon PM, the focus seems to be upon developing PM recommendations into PM frameworks, which, in turn, are to be developed into PM systems. This process is carried out upon an intra-organisational basis, with no analysis of the impact of this PM developmental process upon the external environment – in particular, upon the inter-organisational environment, where other EE nodes lie, such as suppliers and customers. While it may be argued that the PM system that any organisation puts into effect is solely their own business, the concept of PM is changing in the surrounding value chain: increasingly organisations are being asked (and in some cases forced) to accept performance measures from their supply chain partners that they have no immediate interest in. The concept of internal PM existing as a stand-alone concept at each EE node is becoming defunct; isolated internally-oriented PM systems existing at separate nodes in the EE make it difficult for PM information to flow unimpeded throughout the value chain to where it is required (Folan & Browne, 2005).

The situation is being exacerbated by the relative absence of research upon inter-organisational PM. Whilst, by the late nineties of the last century and the early years of this century, researchers had laid down numbers of ever-more complex PM recommendations, frameworks and systems that attempted to address the complicated nature of intra-organisational PM in a holistic manner; complimentary approaches towards inter-organisational PM are in danger of becoming out of touch with the modern propensity, on the part of organisations, to form enterprise networks such as the EE and the Virtual Enterprise. In the coming years, therefore, there is expected to be a significant increase in inter-organisational PM developments – such as supply chain PM and, more particularly, Extended Enterprise PM.

Most of the current inter-organisational PM literature concerns itself with supply chain PM, which focuses upon what are termed by Brewer and Speh (2000) as traditional logistics performance measures (e.g. inventory costs, delivery time etc.). Holmberg (Holmberg, 2000) has suggested that a lack of systems thinking has plagued supply chain PM system design and development: he suggests that measurement activities in the supply chain should not be managed as one system, but as several independent, fragmented, firm-sized systems that are ultimately managed, upon the supply chain level, through the co-ordination of information exchange. A number of frameworks may be seen as extensions of well-established intra-organisational thinking (for example, Brewer & Speh, 2000; Bullinger et al., 2002); in particular of the Balanced Scorecard (Kaplan & Norton, 1992) concept–probably owing to its advocating a “balanced” set of measures, which, in terms of inter-organisational PM, means a balance of internally-oriented measures against externally-
30 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage: www.igi-global.com/chapter/application-fuzzy-performance-modelling-procedures/47463?camid=4v1


Related Content

The Impact of IT Resources on the IT Business Value: Evidence From a Systematic Literature Review
www.igi-global.com/article/impact-resources-business-value/62096?camid=4v1a

Improving the Organizational Integration of IT Governance Tools: An Explorative Study
www.igi-global.com/article/improving-organizational-integration-governance-tools/46642?camid=4v1a

Strategic Management Principles
www.igi-global.com/chapter/strategic-management-principles/23740?camid=4v1a

Tailoring CobiT for Public Sector IT Audit: An Australian Case Study
www.igi-global.com/chapter/tailoring-cobit-public-sector-audit/23686?camid=4v1a