Competitiveness Evaluation of International Contractors Based on Back Propagation Neural Network
—A Strategic Analysis of Chinese Construction Firms

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Outline

1. Introduction
2. Literature Review
3. The Model of the Competitiveness Evaluation of International Contractors
4. Back Propagation Neural Network
5. Conclusions
Introduction

- The International Revenues of Top International Contractors, 1990-2012
Introduction
As Chinese contractors explore in developed countries like the United States, they must face fierce competition from the top international contractors.
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Introduction

Construct an evaluation index system for the competitiveness of international contractors

Adopt Analytic Hierarchy Process (AHP) to calculate the weighted competitiveness index

Build an evaluation model based on Back Propagation Neural Network to test the competitiveness of the proposed model
Three major mainstream schools for enterprise competitiveness:

- Wernerfelt
- Porter
- Prahalad & Hamel

Literature Review
The Components of Contractor’s competitiveness

International Contractor Competitiveness

Enterprise Capability

Internationality
- International sales
- International sales growth

Market Developing Ability
- New contracts
- New contracts growth
  - Transportation market sales
  - Transportation market sales growth
  - Proportion of transportation

Niche Market Ability
  - Operation Ability
    - Gross sales growth

Enterprise Resource

Tangible Resources
- Gross sales

Intangible Resources
- Brand value
- Host country
BP Neural Network Model

Input Layer → Hidden Layer → Output Layer

Error Back Propagation

Revised weight

$X_1 \rightarrow W_{ij} \rightarrow Y_1$

$X_2 \rightarrow \ldots \rightarrow Y_2$

$X_n \rightarrow \ldots \rightarrow Y_m$

Error

Training Signal

Information Transmitting
Initialize the network

Calculate the hidden layer output

Fixed threshold value

Determine whether the computation is done. If not, then return to Step 2