Chapter XI
Decision Support System for Project Selection

Prasanta Kumar Dey
Aston University, UK

ABSTRACT

The evaluation and selection of industrial projects before investment decision is customarily done using marketing, technical, and financial information. Subsequently, environmental impact assessment and social impact assessment are carried out mainly to satisfy the statutory agencies. Because of stricter environment regulations in developed and developing countries, quite often impact assessment suggests alternate sites, technologies, designs, and implementation methods as mitigating measures. This causes considerable delay to complete project feasibility analysis and selection as complete analysis requires to be taken up again and again until the statutory regulatory authority approves the project. Moreover, project analysis through the above process often results in suboptimal projects as financial analysis may eliminate better options as more environment friendly alternative will always be cost intensive. In this circumstance, this study proposes a decision support system which analyses projects with respect to market, technicalities, and social and environmental impact in an integrated framework using analytic hierarchy process, a multiple attribute decision-making technique. This not only reduces duration of project evaluation and selection, but also helps select an optimal project for the organization for sustainable development. The entire methodology has been applied to a cross-country oil pipeline project in India and its effectiveness has been demonstrated.

INTRODUCTION

Many industries are in a period of rapid change brought about by technological breakthrough. Improvements in communications and networking technologies have allowed many companies to expand their operations globally. Advances in computer technologies are changing the management philosophies of organizations. The explosive growth of the Internet and the World Wide Web

is creating virtual organizations and changing the whole concepts of management. Customers increasingly expect products and services of higher quality at lower price and with quicker delivery.

Projects transform organizations' vision into reality. To remain competitive in this globalized business environment, organizations should select and implement right projects efficiently. Major projects can apply science and technology in a sustainable manner but in many instances adversely affect their environment. Socioeconomic impacts of projects can occur at all the four stages of project life: preconstruction (planning/policy development); construction (implementation); operation and maintenance; and decommissioning (abandonment). (Ramanathan & Geetha, 1998).

Customarily, the search for promising project ideas is the first step towards identifying promising projects. Identification of such opportunities requires imagination, sensitivity to environmental changes, and realistic assessment of what the organization can do. The strengths, weaknesses, opportunities, and threats analysis is used by many organizations for identifying projects. Then the projects are prioritized for investment decision. Subsequently, the market analysis for the project is taken up to decide the throughput for the project in line with projected supply and demand scenario. On the basis of the planned throughput, preliminary engineering and design is carried out, which forms the basis for technical analysis. Technical analysis identifies a few feasible project alternatives with respect to project sites, throughput, technology, materials usage, product/service mix, and implementation method depending on type of projects. Subsequent financial analysis determines the most optimum project for investment. While selecting the optimal project for investment, financial analysis also considers uncertainties of the project and suggests mitigating measures. Due to increasing concern of the project affected people (PAP) and statutory environmental regulatory authorities, all projects are require to get environmental and social clearances before receiving approval from competent authorities for implementation (Calvin & Dey, 2002). Accordingly, an environmental and social impact assessment study is required to be taken to determine the positive and negative impact of projects on environment and to develop measures for mitigating the negative impacts. The outcome of the project feasibility analysis is a feasibility report, which is the instrument for receiving approval from competent authorities.

The feasibility analysis of industrial projects using the above steps suffers from the following shortcomings:

- Due to stricter environment regulations in developed and developing countries, quite often impact assessment suggests alternate sites, technologies, designs, and implementation methods as mitigating measures. This causes considerable delay to complete project feasibility analysis and selection as complete analysis requires to be taken up again and again until the statutory regulatory authorities approve the project.
- Moreover, project analysis through the above processes results in suboptimal project as financial analysis eliminates better options (environment friendly alternatives are mostly cost intensive).

Hence, there is enough logic to take up environmental and social impact assessment together with technical analysis so as to select a project for sustainable development not only to ensure organization's competitiveness, but also to provide ecological balance of the earth. Accordingly, the objective of the study has been formulated to develop an integrated project evaluation and selection model for industrial organizations.