

Supplier Selection: A holistic approach for an eclectic decision

(Supplier Selection using AHP/QFD/LP)

Ayush Poddar ¹⁺	C/O:Ramesh Kr. Poddar , 3 Digambar Jain Temple Road ,2 nd Level , Kolkata-7	09831131570	ayush.ricky@gmail.com
Champak Jyoti Sharma ¹	C/O:Dipak J. Sharma , SDE BSNL Office Campus , Phukan Ali ,Tarazan , Jorhat-1 ,Assam	09933802511	champak_manipal@yahoo.com
Bittu Gupta ¹	C/O:R P Gupta ,Lal Bazar P/O:Singtam , East Sikkim	09002090506	bittugupta2010@gmail.com
Bipasha Kashyap ¹	C/O:B K Das , Nilanchalpur , Maligaon , Guwahati	09434381078	amit_ray_2000@yahoo.co.in
Manisha Karki ¹	Quarter No. D178 ,BGR Township ,IOCL Bongaigaon Refinery ,Dhaligaon ,Pin : 783385	09932099977	manisha_krk@yahoo.com
Nabanita Chowdhury ¹	C/O:B Chowdhury , Quarter 56 A , Nambari , Maligaon, Guwahati-1	09002260124	cnabanita20@yahoo.com
Bhaswati Sarma ¹	Quarter No. CT 384 ,BGR Township ,IOCL Bongaigaon Refinery ,Dhaligaon ,Pin : 783385	07679927313	bhaswati27@gmail.com
Amitava Ray ²⁺	Associate Professor , SMIT , Majhitar ,East Sikkim	09434381078	amit_ray_2000@yahoo.co.in

¹B.Tech, 4th Year, Dept. of Mechanical Engineering, Sikkim Manipal Institute of Technology, Majitar, East-Sikkim

²Associate Professor, Dept. of Mechanical Engineering, Sikkim Manipal Institute of Technology, Majitar, East-Sikkim, Email: amit_ray_2000@yahoo.co.in

Supplier Selection: A holistic approach for an eclectic decision

(Supplier Selection using AHP/QFD/LP)

Abstract:

In this work, firstly, Analytical Hierarchy Process and Quality Functional Deployment are integrated to ascertain the weightages of the different suppliers. Secondly, the normalized weightages have been used in the Linear Programming Model to optimize the Total Purchasing Units. Finally, the quality index which incorporates the process capability provides the decision maker to validate the result obtained from the house of quality.

Keywords:

Supply chain management, Analytical hierarchy process, Quality function deployment, Linear Programming Model.

Summary:

The aim of this paper is to develop an integrated analytical model, combining analytical hierarchy process (AHP), quality function deployment (QFD), and linear programming (LP) for rating and choosing the best supplier and defining the optimum order quantities among selected ones in order to maximize the total purchasing value. In the approach, initially, a central relationship matrix of customer requirement and technical requirements is constructed using expertise knowledge of QFD team. AHP is used to determine the importance of evaluating factors and preference of each supplier with respect to each selection criterion and allows the decision makers to incorporate tangible and intangible criteria into the decision making process. Finally, the priority ranking of the AHP/QFD represents the measure of value in the LP model. The methodology incorporates the quality index and provides the decision makers into additional information regarding the robustness of the model so that he or she can make a better decision. The numerical result shows that the proposed group-based decision support system for supplier selection containing various quantitative and qualitative evaluating criteria, and their impact on purchasing decision outranks the conventional approaches to supplier selection.