USE OF OPTIMIZATION TECHNIQUES IN THE CHEMICAL PLANT INDUSTRIES

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Chemical companies are increasingly concerned with the development of planning techniques for their process operations. The incentives for doing so derive from the interaction of several factors. Recognizing the potential benefits of new resources when these are used in conjunction with existing processes is the first factor.

Another major factor is the dynamic nature of the economic environment. Companies must assess the potential impact on their business of important changes in the external environment. Included are changes regarding demand, prices, technology, capital, markets and competition. Hence, due to technology obsolescence, increasing competition and demands of chemicals
there is an increasing need of quantitative techniques for planning the selection of new processes, the expansion and shutdown of existing processes, and the production of chemicals.

We in our problem assume that a network of processes and chemicals is given. The problem is to find conditions which will maximize the net present value over the given time horizon. We use fuzzy relational equations to arrive at the solution. The system is converted into an artificial neural network. The streams of plants that consume chemicals are taken as the input variable and output is got as the processes which maximize the present net value.

To the inputs which are the chemicals consumed the related weightages are given by the experts and the associated outputs are obtained. We vary the weightages given to the chemicals, which are consumed till we obtain the target value. The target value is the optimal value, which we seek for. Thus using fuzzy relation equations we obtain the optimal solutions so that the chemical industry maximizes its present value.