Chapter 4

Multi Agent Approach for Revenue Management

4.1 Introduction

In the previous two chapters it was presented current literature in revenue management efforts and technologies used to model and address issues in complexity. This chapter presents the approach to manage revenues using multi agent technology. Proposed approach presented in terms of inputs, outputs, process, users and features as follows.

4.2 Inputs

Inputs to the proposed system would be, customer booking requests, with or without a bid price. Along with the request customer would provide day of departure as well. That is from the customer side. From the back end or the other side of the system, inputs would be the size of the inventory to be allocated, unit cost, standard markup and number of days to sell the inventory.

4.3 Outputs

System would output the decision if to accept a particular customer order. Otherwise, system would propose a new offer price if the customer requested price is too low. Inventory and price adjustment would also be an output. Generated forecasts will also be a valuable output.

4.4 Process

To transform the input to the output, following agents are identified. Global Manager, Local Manager, Sales, Pricing, Inventory, Demand Forecasting and Competitor price monitoring agents. Upon receiving a booking request by the sales agents, agents will communicate with each other and decide if it is worthwhile accepting the customer booking request. Pricing agents would perform the role of autonomous price adjustments while inventory agents do the most appropriate inventory adjustments. Demand forecasting agents perform forecasts of customer request price and number

of bids to come when requested by other agents in the system. Competitor price monitoring agent monitors prices offered by competitors in the system and updates other agents accordingly.

4.5 Users

From the customer point of view, customers of a particular tour operation organization would be the users of the system from one end. In the other end, it will be the staff and the management who would be using the proposed system.

4.6 Features

One of the main features of the system is autonomous price adjustments to the listed/published prices. Prices listed for the inventory is analyzed in daily basis along with the customer demand movement and adjusted so that room for additional revenue can be made. Another key feature of the system is adaptive negotiation. Sales agents would be keen to negotiate with the customers when sales are under performing. Forecasting of customer request prices and number of requests to come is another important feature in the system. When enough previous data exist, system generates accurate forecasts of customer demand movement and forecasts are made available to other agents to assist their decision making.

4.7 Summary

This chapter presented the approach to revenue management using adaptive software negotiation having the multi agent technology as the basis. Salient features of the system are adaptive bargaining, autonomous pricing and forecasting customer behavior. Next chapter presents the detailed design for the approach mentioned in this chapter.