
Container Transportati on Company

Revenue Management
& Dynamic Pricing -
Group 5

019/47, 125/47, 235/47, 237/47,
317/47, 328/47

Q1. In what way revenue management application in container transportation is similar or different from traditional revenue management application areas, e.g. airlines, hotels etc.?

Space utilization is one of the critical factors for container transportation which is not seen in traditional application areas. Dynamic pricing depends less on the time of booking, rather it is more often a function of the type of cargo to be transportation such as the weight/volume factor, type of container needed for transportation. Moreover, it has bulk orders with fewer number of customers booking majority of the shipment.

In ocean container transportation applications, the products are slots on future voyages, the prices are given by the contract prices, and the resources are the capacities on the voyages. Containers often have to be carried on several voyages between successive ports between their origins and destinations, and thus products share resources as in airline applications. Bookings for different products have to be received before different deadlines; this aspect is handled as described above for the air passenger application.

Q2. If CTC continues with fixed origin destination pricing, how should these prices be set if profitability is to be increased?

After calculating revenues for different cases, where price is decreased by 3% for peak demand and decreased by 5% for slack demand and comparing it with the revenues coming at given prices, we find that the volume increase due to reduction of prices increases the overall revenue and hence the prices for each port should be such that during the peak season, prices decrease by 3% from base price and for the slack season, prices decrease by 5% from the base price.

Q3. What makes for container loadability and how should CTC include the loadability factor into its pricing decisions?

Weight/Volume ratio for the material to be loaded into the containers can drive the efficiencies/inefficiencies in transportation. If weight/volume is such that maximum available space of container is utilized while keeping the weight within the permissible limit, then container loadability is superior. For example, If cumulative volume of material to be transported through a 40-foot container is almost close to the volume of container while the cumulative weight is slightly less than 30 tonnes, then the container utilization is maximised.

CTC can include a multiplying factor for including loadability into its pricing decisions:

Multiplying factor for price = ((weight of container + weight of cargo)/weight of cargo)*(1/Volume utilization of container)

As the relative weight of container with respect to cargo increases or the volume utilization falls, then the loadability is poor and hence the price charged should be higher.

Q4. What are CTC's major shipping constraints? How revenue management can be applied to change those constraints?

Shipping Constraints

- a) Maximum load weight for 20-foot container was 24 tons while it was 30 tons for 40-foot container. Heavier goods often had to be put in 20-foot containers to meet weight limits
- b) Container vessels had maximum container capacity of 2000 TEU and weight limit of 24000 tonnes. This constraint does not affect CTC because the peak demand at port of origin is less than the full capacity of the vessel.
- c) Ratio of 40-foot to 20-foot containers should be between 1.2 and 2
- d) Only 5 vessels but the port of origin are many more. Hence, CTC may have to choose some ports over the others.
- e) Premium demand usually comes in late, so some capacity is reserved on the vessels for this segment. The capacity may or may not be fulfilled, depending on the volume of premium demand.

Q5. How might demand curves be derived from Thomas' price/volume estimates?

Assuming constant price elasticity of demand :

Thomas's pricing decisions for Peak Season 3 per cent price reduction would result in a 5 per cent gain in the volume of containers.

$$dP/dV = -3/5 * P/V$$

$$5 * dP/P = -3 * dV/V$$

$$V^3 = k/P^5$$

Thomas's pricing decisions for Off Season 5 per cent price reduction would result in a 10 per cent gain in the volume of containers.

$$dP/dV = -1/2 * P/V$$

$$2 * dP/P = -dV/V$$

$$V = k/P^2$$

Q6. What might be the next step for CTC if it decides to do further work on implementing revenue management?

Future Revenue management:

Focus on popular routes (not the fixed cost for the routes)

Maximise revenue by changing the price to increase the volume of containers.

Include loadability factor in pricing decisions

Don't compromise on the service level.