

Whose Supply Chain is it anyway?

Introduction

This article derives from a range of discussions with colleagues in the flight catering industry about the dramatic changes to the nature of the supply chain over the last few years - many new and original ways of supplying airlines have emerged. This has led to it being increasingly difficult to understand the relative advantages and disadvantages of different models. In this paper, I hope to identify what has been happening and why it has been happening.

The Elements of the Catering Supply Chain

Since the 1950s up to the 1990s there were three basic supply chain models. These can best be described by first of all understanding all the different elements of the supply chain. These are illustrated in Table 1 below. Table 1 starts with need to be clear about the on board service strategy i.e. exactly what each passenger will get. Such strategies depend upon the market segments being served, their respective seat class designations, the route network and aircraft fleet.

Once the overall strategy is decided upon, the 'offer' that is to be made to each passenger has to be designed. The 'offer' will be made up of tangible items that will include things such as meals, beverages, onboard entertainment, as well as intangible elements in relation to the service onboard. Within the 'offer' there will be a range of different 'items' which we can usefully divide into 'consumables' and 'non-consumables'.

Consumables are those items which are served to the passenger and only used once. These may be 'fresh' items such as meals or 'retail' items that the passenger may take with them when they depart the aircraft such as duty free goods. In most cases beverages can be considered as retail consumables in the sense that they are pre-packaged in sealed containers and could be removed from the aircraft by the passenger if he/she so wished. Indeed passengers routinely ask for spirit miniatures, which they do not consume on the aircraft.

Non-consumables are those items taken off the aircraft by the operator. These can be usefully divided into 'rotables' and 'disposables'. Rotable items are those which are re-used on more than one flight and typically include crockery, cutlery and glassware. Disposable items are those items that can only be used once which typically includes packaging materials of paper, plastic or cardboard.

In some cases, items may be made up of components, most notably meals will be made up of a number of different dishes. Hence it is necessary not only to design and select the item but also to design and select the component. The number of dishes an airline may need in any year can be in the hundreds when taking into account different seat classes, rotations and special meals.

Once the onboard service strategy and offer is known, it is then necessary to ensure that this can be effectively loaded onto and stored aboard the aircraft in the fleet. This process is known as galley planning. In airlines with one seat class and one aircraft type this is very straightforward, but for airlines with a mixed fleet and different seat classes and galley configurations, this can be highly complex.

The next element of the supply chain is sourcing i.e. deciding on who will supply whatever is required. Sourcing can be done at a number of different levels, as

identified above. That is to say, the offer can be sourced, items can be sourced and components can be sourced. Moreover, if the item is fresh, it may be necessary to source raw materials from which the component will be prepared.

Table 1 Elements of the Flight Catering Supply 'Chain'

| | | |
|-----------------------------------|--|----------------------------------|
| Onboard Service Strategy | Seat class Rotations | |
| Design the 'offer' | | |
| Design/select 'items' | Consumables | Fresh Retail (ready-for-sale) |
| | Non-consumables | Rotables Disposables |
| Design/select 'components' | | |
| Galley planning | | |
| Sourcing | Offers Items Components Raw materials | |
| Storage/warehousing | | |
| Inventory control | | |
| Preparation | Components | |
| Assembly/packaging | Items | |
| Tray assembly | Offers | |
| Trolley assembly | | |
| Aircraft loading | | |
| Aircraft unloading | | |
| Recycling | Rotables | |
| Waste disposal | | |
| Costing/Invoicing | | |
| Storage/warehousing | | |
| Transportation | | |

Once sourced, items, components and raw materials need to be transported from suppliers to wherever they are to be stored or warehoused. Once in storage, this inventory has to be controlled to ensure it is secure and held in the best conditions.

From storage, the 'offer' has to be prepared and assembled. This typically involves four stages. First it may be necessary to prepare components i.e. prepare meat, fish, vegetable and fruit either to be served cold or hot. Once prepared these need to be assembled or packaged in some way. For instance, hot dishes are typically assembled into foil containers and sealed with a cardboard top. The next stage is to take all the different items and to put them onto trays. These trays are then loaded into trolleys, on a flight by flight basis. This assembly process can be hugely complex. For instance, a long haul 747 may have as many as forty thousand separate items loaded on to it, which together can weigh six metric tonnes and occupy a space of 60 cubic metres.

Once the trolleys for each flight have been assembled they then need to be loaded onto high lift trucks for transportation to the aircraft, and then the aircraft needs to be loaded. At the same time, incoming trolleys are unloaded and transported back to the flight kitchen.

Incoming trolleys then need to be processed. In some cases, items will be recycled i.e. rotables will be washed ready for re-use. In other cases, items will have to be

disposed of as waste - in particular any fresh food items or disposables. At this point, either the costing or invoicing for the above processes can be carried out.

Finally, suppliers of raw materials, components or items provide two further elements of the supply chain. They store or warehouse these things prior to delivery; and they transport them from their storage facilities to where they are needed.

For many years - from the 1950s up to the 1990s - all of the elements in the supply chain were managed by three main stakeholders, namely airlines, caterers and suppliers. During this period there were three basic configurations of the chain.

The Three Basic Supply Chain Models

In North America, the basic model was for airlines to take responsibility for determining strategy, designing or selecting offers, items and components, galley planning and sourcing. The airlines then contracted out to caterers - storage, inventory control, preparation, assembly, loading/unloading, recycling and waste disposal. Caterers then purchased from suppliers the raw materials, components and items they needed in order to meet their contractual obligations with the airline. This is shown in Table 2 below.

Table 2 The Traditional North American Flight Catering Supply 'Chain'

| | | | |
|------------------|--|--|-------------------|
| AIRLINE | Onboard Service Strategy | Seat class | |
| | | Rotations | |
| | Design the 'offer' Design/select 'items' | Consumables Non-consumables | Fresh Rotables |
| | Design/select 'components' Galley planning Sourcing | Offers Items Components Raw materials | |
| CATERER | Storage/warehousing | | |
| | Inventory control | | |
| | Preparation | Components | |
| | Assembly/packaging | Items | |
| | Tray assembly | Offers | |
| | Trolley assembly | | |
| | Aircraft loading Aircraft unloading | | |
| Recycling | Rotables | | |
| SUPPLIER | Waste disposal Costing/Invoicing | | |
| | Storage/warehousing Transportation | | |

The model shown in Table 2 however, applies only to the supply of fresh items i.e. meals. There was a different model for the supply of retail items, such as alcoholic beverages, soft drinks and duty free good. In this case, airlines tended to negotiate

directly with suppliers; whilst the elements of preparation, packaging and tray assembly were unnecessary as these items came in ready for sale. This retail flight catering supply chain is shown in Table 3 below.

Table 3 The Traditional 'Retail Supply Chain'

| | | | |
|-----------------|--|-----------------|-------------------------|
| AIRLINE | Onboard Service Strategy | Seat class | |
| | | Rotations | |
| | Design the 'offer' Design/select 'items' | Consumables | Retail (ready-for-sale) |
| | | Non-consumables | Rotables |
| | Design/select 'components' Galley planning Sourcing | Offers Items | |
| CATERER | Storage/warehousing Inventory control Trolley assembly Aircraft loading Aircraft unloading Recycling Waste disposal Costing/Invoicing | | |
| | Packaging Storage/warehousing Transportation | | |
| | | Rotables | |
| | | | |
| | | | |
| | | | |
| SUPPLIER | | | |

The retail chain shown in Table 3 was used not only in North America but also in Europe. However, the fresh supply chain in Europe was configured differently to North America, as airlines did not have caterers to whom they could outsource. Hence airlines backwardly integrated into flight kitchens as shown in Table 4 below.

Although there have been many innovations in the supply chain from the 1990s onwards, these three basic models continue to the present day. The larger and growing airlines in the Middle East and Asia have tended to adopt the European model; whereas the European airlines have tended to divest themselves of their flight catering operations and have adopted the North American model. Both in-house and outsourced catering will continue to be adopted in the future, although increasingly this is only likely to be applied to first and business class offers.

This analysis also explains how it is possible for airlines to switch away from complimentary meal service to so-called 'buy on board'. In essence, buy on board is based on the idea that the food items become a retail product. Hence, the retail supply chain can be adopted for this purpose. Low cost airlines, as part of their business model, adopted the retail approach to the flight catering supply chain from the very beginning.

Table 4 The Traditional European Flight Catering Supply 'Chain'

| | | | |
|---------------------------|-----------------------------------|--|-------------------|
| AIRLINE | Onboard Service Strategy | Seat class | |
| | | Rotations | |
| | Design the 'offer' | | |
| | Design/select 'items' | Consumables Non-consumables | Fresh Rotables |
| | Design/select 'components' | | |
| | Galley planning | | |
| | Sourcing | Offers Items Components Raw materials | |
| | Storage/warehousing | | |
| | Inventory control | | |
| | Preparation | Components | |
| | Assembly/packaging | Items | |
| | Tray assembly | Offers | |
| | Trolley assembly | | |
| Aircraft loading | | | |
| Aircraft unloading | | | |
| Recycling | Rotables | | |
| Waste disposal | | | |
| Costing/Invoicing | | | |
| SUPPLIER | Storage/warehousing | | |
| | Transportation | | |

New and Alternative Configurations of the Supply Chain

There are three main ways that the nature of the supply chains outlined above have been changed. First, existing stakeholders have forwardly or backwardly integrated. Second, new stakeholders have taken over some elements of the supply chain and thirdly the supply chain has been re-designed, usually by removing or eliminating some of the elements in it.

One of the first examples of forward integration was in the 1990s when Delta Daily Food, a supplier, forwardly integrated and took over elements of the supply chain normally carried out by the caterer. This was made possible by the proximity of their food factory to Schipol airport, so that it was possible for them to add packaging, tray and trolley assembly to their existing food manufacturing facility. However, this model is relatively unusual, as it does depend on the supplier being located relatively close to airports.

Another way for suppliers to forwardly integrate is to eliminate some elements of the supply chain so that they can supply airports from wherever their factories are located. This typically involves using disposable packaging that eliminates the need for tray assembly and even trolley assembly. For instance, Supplair develop a range of retail style food products and disposable packaging that can be delivered direct to flight kitchens, so that the role of the caterer is reduced to tray and trolley assembly and loading.

A slightly different example of this approach is the Nestle Sky Tray. This concept consists of the 'Hot Pocket' brand, a hand held hot snack, being packaged on a thermally resistance service tray. The trays are packaged in boxes that are the same size as aircraft ovens. Hence boxes can be transported by Nestle to flight kitchens and then loaded directly onto aircraft without any assembly by the caterer. On the aircraft, the trays are unloaded from their container, placed in the oven, reheated and then used to serve the passengers directly from the oven. Not only does the concept eliminate elements of the caterer's part of the supply chain, it also simplifies the airlines design of meals, requiring them only to select the product they want.

As well suppliers forwardly integrating, caterers are also able to do this. This means that airlines focus solely on setting the overall service strategy and outsource the specific design of items, components, galley planning and sourcing to the caterer. Airlines have been encouraged to do this by development of internet based systems such as e-gate matrix and e-LSG, which make transparent what is happening at each stage of the supply chain. Alpha Flight Catering have set up a division called In-Flight Service Management (IFSM) which also takes over many of the activities that the airlines in-flight department may previously have carried out. They argue that IFSM, because it manages many airlines, can afford to employ experts in a wide range of areas that individual, smaller, airlines would not be able to employ; and that such expertise leads to lower cost operation.

Finally, a new stakeholder has entered the supply chain in the form of third party logistics providers, such as Kuehne and Nagel. These logistics companies tend to have a global warehousing and transportation capability that enables them to achieve significant economies of scale. This enables them to take over those elements of the supply chain in relation to storage and transportation at a lower cost than can be achieved by any one of the existing stakeholders. In particular, logistics have been particularly successful with respect to the traditional retail supply chain.

These alternative models of the supply chain are summarized in Table 5 below.

Conclusion

Table 5 would suggest that in addition to the three 'traditional' models of the flight catering supply chain, there are four new models. In fact, these four are simply examples of how different elements of the supply chain are being bundled together in new and original ways. In line with many other industries, it is becoming clear that the concept of the supply chain is somewhat old-fashioned. It is more appropriate to think in terms of a supply network, with all the increased sophistication that a network configuration would suggest. Hence it is possible for a single airline to have adopted a number of different configurations depending on where it flies to, its type of route and so forth.

In addition, this analysis shows that only a few elements of the supply network are always undertaken by the same stakeholder. Airlines are always responsible for their strategy, but may outsource every other element. Likewise caterers are always responsible for loading and unloading aircraft, recycling and waste disposal because no other stakeholder has the infrastructure, ie high-loader fleet, necessary to perform these task. Outside of these areas, it increasingly becoming blurred as to whether or not it is caterers, suppliers or third parties engaged in the different elements of the supply network.

Table 5 Comparison of Alternative Models of Supply Chain

| Supplier Forward Integration (Fresh) | | Supplier Forward Integration (Retail) | | Caterer Forward Integration | | Third Party Logistics | |
|--------------------------------------|----------------------------|---------------------------------------|----------------------------|-----------------------------|----------------------------|-----------------------|----------------------------|
| e.g. Delta Daily Food | | e.g. Supplair, Nestle Sky Try | | e.g. IFSM | | e.g. Kuehne and Nagel | |
| Airline | Onboard Service Strategy | Airline | Onboard Service Strategy | Airline | Onboard Service Strategy | Airline | Onboard Service Strategy |
| Airline | Design the 'offer' | Supplier | Design the 'offer' | Caterer | Design the 'offer' | Airline | Design the 'offer' |
| Airline | Design/select 'items' | Supplier | Design/select 'items' | Caterer | Design/select 'items' | Airline | Design/select 'items' |
| Airline | Design/select 'components' | Supplier | Design/select 'components' | Caterer | Design/select 'components' | Airline | Design/select 'components' |
| Airline | Galley planning | Airline | Galley planning | Caterer | Galley planning | Airline | Galley planning |
| 'Supplier' | Sourcing | Supplier | Sourcing | Caterer | Sourcing | Airline | Sourcing |
| 'Supplier' | Storage/warehousing | Supplier | Storage/warehousing | Caterer | Storage/warehousing | Logistics | Storage/warehousing |
| 'Supplier' | Inventory control | Supplier | Inventory control | Caterer | Inventory control | Logistics | Inventory control |
| 'Supplier' | Preparation | Supplier | Preparation | Caterer | Preparation | Caterer | Preparation |
| 'Supplier' | Assembly/packaging | Supplier | Assembly/packaging | Caterer | Assembly/packaging | Caterer | Assembly/packaging |
| 'Supplier' | Tray assembly | Caterer | Tray Assembly | Caterer | Tray Assembly | Caterer | Tray Assembly |
| 'Supplier' | Trolley assembly | Caterer | Trolley assembly | Caterer | Trolley assembly | Caterer | Trolley assembly |
| 'Supplier' | Aircraft loading | Caterer | Aircraft loading | Caterer | Aircraft loading | Caterer | Aircraft loading |
| 'Supplier' | Aircraft unloading | Caterer | Aircraft unloading | Caterer | Aircraft unloading | Caterer | Aircraft unloading |
| 'Supplier' | Recycling | Caterer | Recycling | Caterer | Recycling | Caterer | Recycling |
| 'Supplier' | Waste disposal | Caterer | Waste disposal | Caterer | Waste disposal | Caterer | Waste disposal |
| 'Supplier' | Costing/Invoicing | Supplier/ Caterer | Costing/Invoicing | Caterer | Costing/Invoicing | Caterer | Costing/Invoicing |
| | | | | Supplier | Storage/ warehousing | Logistics | Storage/warehousing |
| | | | | Supplier | Transportation | Logisitics | Transportation |