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INTERNATIONAL LOGISTICS IN FLIGHT CATERING*

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Abstract: As it is well known the flight catering industry is very demanding. Taken into account the time and effort involved in training staff, organizing transportation and stocking of food supplies to warehouses we can conclude this business is not for the inert. Since travel catering is a multibillion dollar industry with projections of its growth in the future, members of this industry see the need to get their part. How they get their share will determine mainly on their "know-how".
Knowledge is vital in a sector which is engulfed by technological advances, especially in aviation. As we continue to expand the need arises for personel with competent qualities. What this summary will engulf is the logistical functions of catering in the flight industry. An important issue which not just the operational staff on the field has to know but every member involved with flight catering. Without proper catering logistics there is little need for flight, just for the fact that the guest will not be receiving the service he paid for, and in turn affecting the company image. Whether we are serving duty free goods or food onboard flights, innovation and quality in service will be demanded by our customers.

Key words: international logistics, flight industry, flight catering.

INTRODUCTION

It can be said that flight catering is mainly logistics and very little cooking. The complexity of flight catering is quite clear when we take into account the variety of items that must be loaded for passenger service, together with the need for them to be loaded at widespread locations. Adding value and reducing costs across the entire flight catering system is what logistics is all about. It focuses on the non-consumable and

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non-disposible items (glassware, trays, crockery, etc), although it is adressing other types of inventory as well (alcoholic beverages and duty-free items).

Given the importance and scale of logistics in flight catering, it is clear that this subject is taken very seriously. In fact, logistics as a process that goes beyond boundaries has only relatively recently been recoginised within the industry. One of the reasons that logistics has been relatively uncoordinated to date is that the information systems to manage this complexity have not existed in an intergrated format, especially since airlines, caterers, and suppliers have often used different platforms for their IT. This lack of integration has also meant that it has been difficult to monitor the logistics function, with the absence of data, it has been difficult to establish the key performance indicators.

The main objectives of a logistics system are based around getting the right products-materials to the right place(s) at the right time and at least cost. This summary attempts to deal with the complex issue of the logistics of flight catering by first addressing the particular characteristics of the logistical problems faced in this industry before analysing the problem from the standpoint of a typical logistics approach.

LOGISTICS ISSUES IN FLIGHT CATERING

The logistics issues of flight catering are affected by a number of important features of the airline industry, the most important being the basic features of the business, the specifics of route scheduling, the impact of actual passenger loading, and the product mix.

International airline business activity

The basic features of the industry are that it has global dimensions, it is highly competitive, and profitability depends largely on maximising revenue in the face of variable demand. The ailine business is increasingly competitive and most airlines in considering their competitive edge take account of the quality of the service package offered to customers. For instance, there are strong pressures in some cases to use quality non-disposable equivalents. The reinforcement of brand image also causes most to require that several items bear the company brand and logo. This has strong implications for the logistics problem since it could prevent local supply of these items.

Demand can be highly variable both in the longer and shorter cycles. Profitablitliy is highly dependent on maximising revenue for which the technique of yield management was devised. The basic aim of this is to maximise passenger loading while as fast as possible ensuring that the average fare paid by customers is also maximised. This may result in a wide variation in the passenger mix. At peak times when seat sales are relatively easier there may be a high proportion of first/class passengers, while at offpeak times there is a hight proportion of sales in the economy class. Thus, the logistics system must be capable of adapting to variations not only in passenger numbers but also in the mix of passenger service requirements. For instance, outbound flights from Zagreb to European destinations will carry a high proportion of

business people, especailly in the morning, whereas the return flights will have a hight proportion of leisure travellers and or tourists. Likewise, during peak summer months, flights into Croatia will carry a abundant mix of tourists than any other time of the year.

Route scheduling

Routes and schedules operated by airlines will have a significant impact upon the overall organisation of the logistics system. For many scheduled operators, the service offered on a particular flight may well be influenced by the following[2]:

- route served
- length of haul
- number of intermediate legs
- sector times
- customer revenue class
- aircraft configuration

In order to maximize seat occupancies, flights often have intermediate stops so that tickets may be sold not only for an entire flight but also for parts of it, that is one leg of the journey. This presents additional logistics complications of restocking aircraft at intermediate stops. For instance, although it is technically possible for an aircraft to fly non-stop from Europe to the far East, many flights have a stop-over in the Middle East or India in order to improve seat occupancy levels and in turn increase revenue.

Long haul flights present special problems in terms of coordinating the logistics function. This is particularly the case where airlines have full traffic rights and seek to maximize revenues from each sector of a multiple leg flight. Logistical arrangements can be varied when catering uplifts are in question. For example, long haul economy meals, being high volume and having relatively standardized products, may be supplied from the place of origin and an intermediate port of call. However, on the same flight first or business class meals offering extensive customer choice and menu flexibility may be catered throughout from the place of origin. Maintenance of a consistently high standard of service may leave this as the only viable option. It is advantageous to uplift items such as liquor and cigarettes somewhere else on the journey.

Passenger loadings

Passenger factors are major motivators which test the responsiveness of the logistics system on a day to day basis. The size of uplifts for meal trays are dependent upon how many passengers are aboard. In order that balance is maintained within the system, equipment levels will have to remain relatively constant. For short haul flights, which fly to a destination and return directly to point of origin, there should be no major problem. If the aircraft flies out with a full set of equipment, it should return with

[2] Pilling, M., "Smarter Service," *Airline Business, 2003.*

a full set. But even on short haul, in an aircraft with a flexible cabin that allows the size of business class relative to economy to increase or decrease, some equipment imbalance can occur. On long haul flights, however, especially those with intermediate stop-overs and more than one meal service, equipment taken off the aircraft at one point may not automatically be reloaded at the same point. To overcome this problem, airlines have adopted 'dead heading'. This involves loading aircraft with equipment items sufficient for the maximum number of passengers regardless of meals required, thereby ensuring that equipment exchanges at intermediate of final destinations can take place without excess stocks developing in some parts of the system and shortages occurring elsewhere. Thus, it is a logistics requirement that equipment exchanges take place satisfactorily under conditions where, for example, outward flights may be carrying low occupancy but return legs the opposite. Unless massive stocks were to be held at each catering supply point it is easy to imagine a situation where differences in passenger numbers could lead to much of an airline's equipment ending up in one place. Even for charter business where passenger loadings are less volatile and return catering more common, this type of arrangement tends to hold for equipment items.

Many airlines operate aircraft dedicated to particular routes and with fleets conforming to identical configurations. Therefore, any change of aircraft for whatever reason, such as maintenance overhauls or traffic delays, should have little impact upon the logistics function. Where aircraft variations do exist, problems with equipment supply may arise. In turn equipment variations can force change in other areas such as food items served.

Product mix

Typically a service package is taken to include tangibles, that is goods provided for the customer, and intangibles, relating to the quality of service provided for the customer. The flight service package includes both. Logistics tends to focus on the provision of just the tangible elements. The problem to be addressed is the need to ensure that any flight, whatever its place of origin and destination, is fully stocked with the physical items contained within the service package, together with clean and functional equipment requested by cabin crew for providing service. Broadly, these goods fall into four categories[3]:

- Food items
- Non food items
- Duty free goods
- Equipment required by cabin crew for providing service

Many of the items used are consumable not only in the direct sense, such as food an paper items, but also because it is expected that passengers will retain them after use. In such cases it is essential to arrange fresh stocks for each flight. Some items are rotable, implying they may be used more than once. However, it will be necessary to service them between uses. For instance, blankets need to be washed, according to

[3] Birchfield, J.C., *Design and Layout of Foodservice Facilities*, Van Nostrand Reinhold, New York, 1988.

procedures issued by the manufacturers, and headsets sterilized. Even wit rotable items it will still be necessary to replace defective items or make good shrinkage. Shrinkage arises from items being broken, damaged, lost, misappropriated, or mistakenly retained by passengers.

For each category of goods, there is also likely to be a variety of reflecting the different seat classes, and possibly cultural factors. It is essential for the logistics system to restock the aircraft adequately with items of the right quality as specified by the operating standards of the company and not simply topping up from local stocks to the adequate quantity level.

A network of providers

The diversity of the materials and products consumed on the aircraft means that there are a number of interrelated distribution systems needed to service the aircraft. One is the conventional distribution of non food consumables and some dry goods for the stocking of warehouses and or stores. This kind of distribution is obviously carried out by suppliers to central production units or bonded stores. But it may also be carried out by airlines, or their agents, for the distribution of goods or materials from their central stockholding facility to satellite units. For instance, BA transports stock by road from Heathrow to the other UK airports at which they operate, and cargo freight by sea and air for stocking stations outside the UK. The second type of logistics system is that relating to the socking of aircraft with prepared meals, and a third relates to the transportation of rotable equipment from one airport to another to ensure that equipment is balanced. It is these latter two interrelated systems, unique to flight catering, that this summary is focused on.

Some airlines such as those which operate in Croatia manage their own flight catering service, based around flight productions units owned and operated by the airline. This is particularly so in the case of countries where costs are lower, whose monetary exchange rates are disadvantageous, or which have restrictions on the use of hard currency. In such cases, it is common for them to attempt to stock the aircraft no only for the outward flight but also for the return flight except when other considerations prevent this, such as food shelf life. Most others contract out to caterers. Such airlines, therefore, use agents for outward and return flights. The problem is compounded by some flights having intermediate stops. This may be required for refueling or to maximize seat occupancy, adding passengers for each hop of the flight to those traveling the whole distance. Different agents may come into play when, in the situation mentioned above, restocking may be necessary in each leg of the journey.

This network may be further extended by subcontracting. It is increasingly the case that flight production units are concentrating on tray and trolley assembly, and subcontracting out meal production to specialties suppliers. In some cases, these may be very small businesses undertaking small steps in the process such as sorting out cleaned cutlery and packaging complete sets which are returned to the main agent for incorporation into meal trays.

Key logistics decisions

A major airline operating on a global scale will, therefore, need to operate via an extensive network of agents with attendant subcontractors in some cases. Not only will these need to conform to the standards expected by the airline but may need to be supplied with at least some items that they cannot source themselves. This can result in a complex distribution network ensuring that the supply agent at each and every airport has adequate stock levels of a wide range of products ranging from small consumable items bearing the airline livery to replacement rotable items. This can be done directly from the home base or via regional depots.

There are basically three key logistics decisions that need to be made by an airline. These are the extent to which return or back catering will be carried out; whether to utilize the flight service facilities of those airports into which flights are routed; and whether to use local suppliers.

The return catering decision

There are basically two options in arranging provision for return flights. Return catering entails carrying provision for the return flight on the outward flight. Alternatively, the return journey can be restocked through a local agent, or less commonly from an airline outstation. In most cases, there is a mixture of these two options, some items being back catered and some being provided by local agents. Factors governing which of these options to adopt are:

Hygiene, on longer flights, it may be impossible to guarantee the safety of back catering. On the other hand, an airline may consider that there is no local agent who can meet the specified hygiene and or quality standards.

Cost, it is in the interest of airlines in low cost countries to use back catering as extensively as possible. Conversely, airlines from high cost countries may find it attractive to restock locally as far as possible.

Payload space, the potential coast advantages of return catering can be offset by the space or weight requirements of the items for the return journey. The additional weight increases fuel used by the aircraft and the additional volume may reduce freight capacity if carried in the hold or reduce seating space if galleys are enlarged for carriage there.

Security, some items may be highly desirable and easy to pilfer if stocks are provided for local re-supply. For this reason items such as coffee pots and headsets are usually back catered.

Control, Back catering may be preferred in some cases since it offers greater control than may be possible with local agents. In some cases it may also avoid security problems such as drug smuggling or the planting of terrorist devices, as containers are sealed at point of origin.

Quality assurance, airlines try to avoid overstocking and go to great lengths to load just sufficient meals for the number of passengers on the journey, even topping up at the last minute. At the outset of an outward flight it may be difficult to predict the number of passengers on the return flight. Local re-supply is more flexible and allows a better match to passenger numbers. On charter flights, passenger loading is more predictable than is sometime the case with scheduled flights an back catering is less likely to lead to over or under provision.

Local availability, some items may not be available locally and if perishable, must be carried out on the outward journey, for instance newspapers.[4]

Airport capabilities

Maintenance of customer service levels and cost control will for all airlines, be influenced by the servicing capabilities of airports visited. The impact of this factor can be significant even for major international airlines operating on the most lucrative scheduled routes. From a logistics perspective, tightest control exists when an airline operates from its home base or hub. Major international airlines usually service flight internally through their own catering facilities when operating from their main base or another major domestic centre. In many cases airline operated catering facilities will have sufficient capacity to supply other airlines flying to that centre.

Airlines operating away from their home base will, because of scale economies, normally use the services of a local caterer. In some cases, this may simply mean using different units owned by the same company. Thus, it may prove possible to maintain the important understanding that underpins any successful relationship between airline and caterer.

At major international airports, such as London Heathrow, airlines may be able to derive benefits from a competitive marketplace. however, in heavily regulate aviation markets these benefits may prove illusory if access to gates is denied or jealously guarded in favor of a home carrier. Even within the European union it is possible to find a monopolistic catering situation at a major international airport, for instance in Rome. Being, a major player in the global aviation market offers no immunity from the resultant loss of control or higher charges levied with respect to catering facilities. Scheduled airlines operating into and out of regional centers will, in the majority of cases, have access to only one caterer. For charter services, some remote and or minor destinations may offer few or no catering facilities. Thus it may be necessary to operate on a fully catered basis from the airline's home base. Scheduled operators can face this problem in varying degrees. Just as airlines shop around when refueling on certain routes, catering services may be declined in part or whole if deficiencies are seen to exist at a particular airport.

While traffic volume is a principal determinant of an airports capabilities, the adequacy of catering facilities is dependent upon a number of other factors. Airlines

[4] Jones, P. and Bertorello, V., *The Process of Innovation in Flight Catering*, 2001.

may not use services on offer for reasons ranging from poor transportation and loading arrangements to fears concerning the safety of basic supplies such as water. The pivotal role of equipment exchange alone dictates that airlines find equal players at destinations served by their aircraft.

Market growth achieved through the opening up of new routes and new destinations may be checked by the speed at which support services such as catering develop. As a consequence it is not uncommon for airlines and caterers to collaborate in joint ventures aimed at producing the required infrastructure.

International and local supply

Procurement decisions will, more than any other factor, determine the complexity of the logistics function. Arrangements between airlines and caterers vary considerably, giving rise to wide differences in contractual and operational obligations. At one extreme, and airline may leave sourcing of products and materials entirely to the caterer. This tends to be the case with most charter businesses. Alternatively, sources of supply may be identified and specified by the airlines themselves. For cost scheduled operators some intermediate position holds.

The major international airlines are often large corporations capable of wielding significant purchasing power. Therefore, it may be the case that supplies of materials to the caterer are organized through contacts negotiated by airlines themselves. This is most likely where an airline operates a centralized purchasing system or is part of a much larger holding company. It has to be recognized that some caterers, such as Gate Gourmet and LSG Sky Chef, are also global organizations possessing comparable purchasing power.[5] However, some airlines do not simply make purchasing decisions on unit cost grounds alone. They are influenced by their position as a national carrier, strategic alliances formed with other multinational companies, the brand image they are trying to create for their flight catering, and so on.

Where airlines specify the use of own branded products supplies will often come to the caterer via the airline's home base. For the contracted caterer this may result in high inventory levels and warehousing costs. Meeting the tastes of its home customers abroad may also result in supplies being shipped from home base, if no local supplier can be found. For other products, such as liquor, handled by the caterer, an airline operating a centralized purchasing system may source items themselves, and ship them to the home base before distribution takes place to end users. Given that this practice is widespread for items such as wine and bearing in mind the shipment involved, many wines must be tough for traveling!

Even where systems are heavily centralized caterers are still given scope to utilize local supplies. Frequently, this can result in higher product or material quality and lower costs. For instance, countries such as Bosnia and Albania offer high quality

[5] Momberger, K. and Momberger, M., "Aviation catering news", *Momberger Airport Information*, 2003.

fresh produce at very low prices. In such countries, the relatively low volume of purchasing may mean that these low unit costs do not make significant cost savings when the total cost of obtainment is taken into account. Other factors will also influence the decision to use local supply. For example, poultry sourced from the China may not be regarded as acceptable if fears over the chicken flu disease command the attention of passengers. Also, it has to be recognized that many national airlines literally fly their country's flag, where the airline is state owned, preferential status may be given to home produced goods. Thus national interests may take precedence over purely commercial considerations.

Warehousing

In many distribution systems, warehousing and transportation perform key roles in support of the marketing function. Therefore, the development of an effective system will focus upon issues such as the number, size and location of warehouses. In turn, these factors together with routes operated, influence the choice of transport. In the flight industry, the warehouse is often in the same location as the central production unit. Of the four kinds o goods identified above food items are highly perishable with a shelf life of only a few hours, whereas the non food items, duty free goods, and equipment are not perishable.

With flight service, the warehousing function is of major importance but has a different orientation compared with, for example, retailing. There are three main differences. First, flight warehouses tend to stock raw materials rather than goods available for final consumption; with the exception of items such as duty free very few products are actually supplied to a marketplace. Second, stock holding and supply of equipment are just as important as product and or materials. Finally, location of warehouses tends to be fixed, usually within close proximity of an airport. Assembly of meals and of aircraft total service loads is usually on or near the aircraft boundary where space is at a premium: stocks may be held some distance away. Therefore, the warehousing function in the context of flight catering bears a closer resemblance to the network of supply points operated under a military logistics system than that operated by supermarket retailers. Although the main warehouse operated by an airline or caterer may hold non food stocks as finished goods in case quantities, the production of meals and location of equipment at distribution points in a network around the world create a military style logistics system.

The amount of space relative to the production capacity of the kittens varies widely. For example, the total size of the KLM production unit at Schipol, Amsterdam is 9,500 m2 of which 4,000 m2 s racked warehouse storage. This unit stocks over 3,000 different non perishable catering items and has a maximum capacity of 25.000 meals.[6] Where the caterer is a servicing agent potentially more warehousing space will be required. Some of this will be geared directly to the caterer's production facility, the remainder to supplies specified by each of airlines with whom the caterer has contact.

[6] Jones, P., *"Flight Catering"* second edition.

The range of distribution costs will be affected by the caterers stocking policies and the number of items serviced.

Transportation

Unlike other distribution systems the transportation in flight catering centers around scheduling rather than routing. Most retail supply chains necessitate applying routing algorithms in order to establish the most efficient and effective way of supplying a number of outlets spread over wide geographic area. In flight service, trucks basically travel between the flight unit and the airport apron. Even though the aircraft being serviced may be located at different stands around the airport, this does not present significant routing difficulties. However, airlines and caterers that have a main distribution centre and make road deliveries to production units at a number of airports will adopt the same kind of routing algorithms as retail distributors.

Inventory management

In providing the desired level of service, warehouse stocks provide an important buffer between supply sources and demand which may at times be variable and uncertain. The stock levels sustained in flight warehouses and production units are very large. Research indicates that both airlines and caterers would generally agree that stocks ay be greater than needed, thereby tying up capital in underused equipment. In the past, the philosophy has been 'better safe than sorry'. Often the cost of trying to devise and implement a system of stock control that would achieve higher levels of utilization was greater than the savings to be made. With the development of just in time (JIT) systems, bar coding, and materials handling systems, it seems likely that this will be a major area for significant development in the future. At least one major international airline believes that it could save several million pounds per annum through reducing stock holding levels.

The function of inventory management is to maintain some kind of balance between the cost of investments in inventory and the benefits bestowed in terms of better availability of materials and or products. Combined inventory costs can be quite substantial and comprise storage costs, handling costs, interest charges, shrinkage, wastage, and insurance costs. Ultimately, it is the opportunity cost of capital tied up in inventory that has to be justified. Lowering inventory levels simply to reduce these costs runs the risk of incurring stock outs. For many inventory systems, this leads to other costs in the form of lost or delayed sales. For flight catering this will show up as lower customer service levels and perhaps for the caterer a risk of losing contracts.

Stock replenishment and inventory policy, whether based upon classic economic order quantity (EQQ) models or a JIT based approach, will be influenced strongly by the distinctive nature of flight service.

Operations spanning national boundaries and the possibility of restocking stop over or return flights add degrees of complexity seldom found in many logistics

systems. Given the scale of the warehousing and supply function, stock levels may be a source of tension between agents and airlines. It is in the airlines' interest to minimize stock levels, since they bear capital investment costs, and in the agents' interest to maximize stock levels, since they bear much of the stock out inconvenience, storage and handling cost.

Information systems

A logistics system geared up to supplying a complex service package to the required standard first time and every time wherever an airline operates, places heavy demands upon managers in terms of information handling.

At one level it is necessary to collect hard data for control purposes. For example, the stocks of rotable equipment if not tracked carefully may not be utilized in the most efficient manner. Some airlines such as Qantas use sophisticated computerized systems to monitor allocation and use of equipment items. The system is designed in such a way that automatic replenishment from the airlines home base in Sydney keeps stock held and required by caterers at appropriate levels. Airlines such as Cathay Pacific, operate in a centralized purchasing and supply system, also maintain high control through their home base.

Aircraft movements and the primary business of passenger airlines create a need for information suitable for planning purposes. Catering contracts with airlines tend to operate over a relatively long time period and require some degree of long range planning from the position of supplies. Seasonal and daily demand fluctuations in passenger numbers will transmit themselves through to the logistics system. It is usual for caterers to monitor passenger numbers 48, 24, and 12 hours prior to departure. Although many may plan their production around this lead time, the logistics system may need to be more proactive in terms of forecasting. As logistics have become more and more important, many caterers now ask for at least weekly forecasts to support JIT delivery of raw materials.

CONCLUSION

The core activities of a logistics systems-distribution, warehousing, transport, and inventory management- may be viewed as forming part of a complex mosaic; the supply chain spanning the objectives and constraints of diverse functions such as marketing and procurement. Measurement of system performance may well lead to attention being focused upon operating costs and resource efficiency. However, in addition to these largely quantitative indications, customer service levels and overall effectiveness require serious consideration. Indeed, it would seen entirely appropriate to view the contribution of logistics from a 'value analysis' perspective. Logistics, like marketing, is now recognized by many companies at a strategic level for the competitive edge it may bring in today's marketplace. Thus, any review of performance must consider the impact of logistics upon the whole system and not in terms of optimizing individual components of a complex network.

From the customer's perspective, the impact from logistics and the catering system in general may seem indirect. For airlines, the impact of logistics upon core business activities is direct and measured in terms of passenger numbers. In the end, this translates into the difference between profit and loss. While passengers may have the freedom to choose between one package an another, airlines are constrained to provide the customer with a package of services. Logistics ensure that the package is delivered at least cost to the airline and to the service level demanded by the customer.

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