FLIGHT CATERING

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ISBN 978-81-945630-8-2

Edition : 2020

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

FLIGHT CATERING

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Flight Catering

BLOCK 1 : INTRODUCTION TO FLIGHT CATERING & FLIGHT CATERING INDUSTRY

INTRODUCTION TO FLIGHT CATERING & FLIGHT CATERING INDUSTRY

Block Introduction :

This block will make us learn about the starting of Flight Catering industry in the world and how it evolved over the years. The flight catering has become the integral part of aviation industry. It has not only content the appetite of flying passenger but also added luxury quotient. This block further make learner aware about the attributes of flight catering industry and what role different stakeholder like airline companies, passenger, suppliers and caterers has to execute to improve industry standards. This block discusses the pricing of meals in various class of air travel, along different routes and countries. The appetite of flying passenger is not same as passenger on ground. So it is very important to understand the appetite and food behaviour of passenger. It is very technical and there is research going on this aspect of flying.

Block Objectives :

After understanding this block learns will have knowledge of :

- Historic development in Flight Catering
- Importance of Flight Catering in aviation industry
- Characteristics of Flight Catering & Role of stake holders
- Evolution and development of Indian flight industry
- Introduction & characteristics of flight catering
- Issues and trends in flight catering
- Pricing, viability, flight type and class
- Passenger's food Acceptance and Food Sensory Analysis
- Food and mood, environment and food, effects of specific foods

Block Structure :

Unit 1 : Background of Flight Catering

Unit 2 : The Flight Catering System

Unit 3 : Pricing of Flight Meals

Unit 4 : Passengers Appetite and Behaviour

UNIT 01

Background of Flight Catering

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- Provide a brief overview of the relationships between the four different stakeholders concerned with flight catering
- Identify the role of the four stakeholders within in flight service
- Explain the nature of contracts and the tendering process between airlines and caterers
- Understand the implications of alternative approaches to on–board food service

1.1 INTRODUCTION :

Aviation has continued to expand. It has weathered crises and demonstrated long–term resilience, becoming an indispensable means of transport. Historically, air transport has doubled in size every 15 years and has grown faster than most other industries. Airlines worldwide carry billion passengers annually with trillion revenue passenger kilometres (RPKs). Every year million tonnes of freight transported, reaching billion freight tonne kilometres (FTKs). Every day, around

100,000 flights transport over 10 million passengers and around USD18 billion worth of goods. On the basis of food type, in–flight catering service market is classified into meals, bakery and confectionary, beverages, and others. The meals segment was the leading segment in the global market, owing to increase in number of passengers and long duration air travels. In addition, various catering companies have introduced various types of meals such as mini–meal for customer with moderate time of travelling thus fuelling the growth of in–flight catering service market. Furthermore, introduction of online platform for ordering food and stringent hygiene regulations for food products are expected to further boost the market growth.

1.2 HISTORIC DEVELOPMENT IN FLIGHT CATERING :

How can human fly ! They don't have wings. It was very much fascinating for human to fly like birds and cover miles in a few minutes. The dream came true, approximately 100 years ago when Wright brothers succeeded and formed American Wright Company in 1909, to start manufacturing Airplanes for US military. It was not easy for them to convinced government to purchase their Airplanes but anyhow due to their persistence and hard work they got opportunity. Through the passage of time more company have advanced the technology and we have varieties of flights. Before Wright brothers (Orville and Wilbur Wright) many have tried to make human to fly.

The food service habits and techniques on flights have been changing since the early days of aviation. It is being claimed that the first airline meal was served in 1919 on a Handley–Page flight from London to Paris (fried chicken, sandwiches, and fruit salads were served.). Initially it was important to focus on weight to be carried in–flight. With the advancement in technology and development in planes' capabilities on–board kitchens have been started in the 1930's, and it continued to more advancement. In some where 1935 beverages were included along with some salads like grapefruit salad, crabmeat cocktail, eggs salad etc. It was 40's when frozen food were started to serve on–board. In 1950's Beer, Chicken pie and more items has been included into it. With continuous advancement in Aeronautics, aviation industry has got more advancement and confortable options to serve foods. At the same time the jets become faster and taking lesser time to travel, that enables aircrafts holding more passengers and they had to speed up the process of serving food during 60's. To minimise weight in flight is always a concern for service provider, although approximately 20% of total weight is of food and related items only. They started plastics and other

disposables glasses, plates, knife and fork instead of traditional metallic items. That not only reduces weight but washing and storing time and expenses some flights focus on serving up foods that do not need cutleries (finger snacks). Airline catering has become billion$ business it will grow day by day. It generates economic growth, creates jobs, and facilitates international trade and tourism. During 80's Airlines begin to emphasise on salty, rich and spicy food that is more suitable to reheat and retains flavour at height.

1.3 IMPORTANCE OF FLIGHT CATERING :

The air transport industry created approximately 62 million jobs across the globe both direct as well as indirect. Out which 10 million are direct employed. Airlines, air navigation service providers and airports directly employed over three million people. The civil aerospace sector the manufacture employed 1 million people. More than 5 million are working in other on–airport positions. If we talk about people who are indirectly benefited or working it term to 52 million, it include tourism and hospitality sector jobs which is supported by aviation. These estimates do not include other economic benefits of aviation, such as the jobs or economic activity that occur when companies or industries exist because air travel makes them possible, the intrinsic value that the speed and connectivity of air travel provides, or domestic tourism and trade. Including these would increase the employment and global economic impact numbers several–fold.

At present, consumers' request for airline meals is not only to fill the stomach, but to enjoy featured and high quality cuisines as those offered by high–end restaurants on land. Various major airline companies have dedicated to improving catering quality to attract consumers. So it is important to maintain quality of food it also increase profit as well as reputation and customer loyalty.

1.4 CHARACTERISTICS OF FLIGHT CATERING SERVICE:

Service quality is focus for airline companies to build image among passenger's they believe passengers replicate those image among their circle. Service personalization is very important now days both ground and on board service supports in retaining satisfied passengers and attracting new ones. Meals on–board may have difference in quality and quantity among airline companies and classes of travel. They range from a simple beverage in economy class to a full course meal in first class. Meal is served to passengers on board a commercial airliner either in tray or from trolley. Airline catering service provider prepares meal at ground and deliver it to flight, now its flight stewards call to reheat and serve to passengers. The first kitchens preparing meals in–flight were established by United Airlines in 1936. Some common characteristics of these meals are **:**

- Limited serving staff
- Finger foods
- Pre–Cooked food
- Limited time to serve
- A–la–carte menu
- Pre–ordered meals
- Small portion

- Vary from class to class
- Expensive
- As per need of passengers

Limited serving staff : airlines carry multitasking trained staff, who is capable enough to both serving meals, tea/coffee, water etc. and complaint handling as well, they don't carry staff separately for serving and cooking foods. That too in limited number what is necessary, avoiding weight.

Finger foods : It is ideal to serve finger foods like burgers, sandwiches, salads etc. that doesn't require cutlery. It's also helps in controlling water waste in dishwashing, and the unnecessary weight of these things can be avoided.

Pre–Cooked food reheated in flight : meal is prepared in kitchen on land, and then delivered to airplane and reheated and served by flight attendants.

Limited time to serve : due to fast service need of flight to travel server has to speed up the process of serving food, there is less time to give elaborated service as initially.

A–la–carte menu : this enables own choice and you need to pay only for what you ordered. Suppose you order a puff pastry so you have to pay for it only, unlike Table d'hôte where you need to pay for whole package.

Pre–ordered meals : this choice helps both the passengers and service provider. As the passenger can order as per their choice and caterer need to supply that food only instead random and jumbling.

Small portion : food comes in smaller quantity to reduce wastage. May includes meat, chicken, beef, or fish, a salad or vegetable, a small bread roll, and a dessert.

Vary from class to class : level of service and menu depends directly on class you are travelling. Meals may be served as "one tray" or in multiple courses with no tray and with a tablecloth, metal cutlery, and glassware (generally in first and business classes).

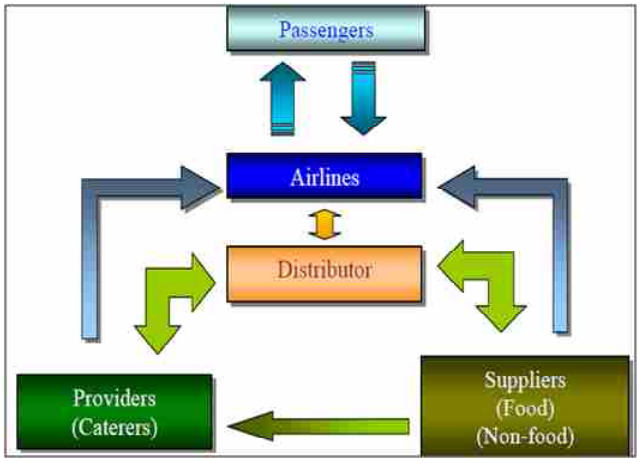
Expensive : expensive as compare to restaurant meals.

As per need of passengers : now it is part of competition, companies provide special meals to meet the consumer needs for personal, physiological, pathological, and religious requirements and sentiments.

1.5 ROLE OF STAKE HOLDERS :

Aviation is a global industry connecting people, cultures and businesses across the globe. People who are working in sector are committed to raising awareness for the benefits and the role of aviation. It is necessary for all stakeholders to work together to maximize the benefits of air transport, and to support the sustainable growth of aviation by connecting more people and places.

Flight catering development is depend on four separate groups can be termed stakeholders. These four are **:** Airlines, Passengers, Caterers and Suppliers. With mutual co–operation among these four airlines catering can be succeed. Dedicated flight catering companies were founded some around 1940–50. Some airlines formed their own catering divisions at the same time independent flight caterer came to provide support to other airlines. As the industry has fragmentary and international nature of the business, close co–ordination is required between the passengers and the airlines and between the airline and the providers and suppliers



1.5.1 Role of the Passengers :

Inside the flight, during their journey passengers seek the value for money. She/he expects the level of service to match the money they have paid. However server inside the plane must have understanding of human behaviour. Some of the customers want to have their meal service delivered at their own pace, so that they can have more time and privacy to rest or work, some may raise nutritional concerns. You can say that passengers are unaware of the back–of–house activities that underpin their on board experience **:** menu planning and preparing dishes and meals through a complicated supply chain, loading the very large quantity of products on an aircraft, or the cost structure. Nor are they aware of the constraints placed on caterers. But why should be they aware about all these, if they are paying high as compare to off–board. Despite of reasons rather say giving excuse, it's yours (service provider) look out how you are managing but passengers should get comfort and must feel value for money.

1.5.2 Role of Airlines :

With increase in airliners the competition also increased. They not only have to provide comfort inside the plane but others too. Food and fine dining, Wi–Fi connectivity and on–board entertainment, duty–free in–flight shopping, are few of the in–flight services gaining in popularity as new value added services capable of opening new revenue opportunities as well it is becoming mandatory for airliner to provide.

With the increase in expectations of passengers, airlines are striving hard meet those expectations since beginning. Innovations are highly required but it is not so easy because they also have to point out and work on factors like **:** passenger specification, e.g. ethnic origin or religious belief, effects of delay on loading meals on to the aircraft and balance of the menu in terms of dietary requirements, and so on.

Airline is actual customer for caterer. An airline is a customer who arrange and assembles all the services for the passengers. So they have to develop policies as per passenger's demand. The caterer must think of demands and requirements of the airline and any wider motives that the airline may be seeking to develop. The airline though, theoretically at least, seeks to establish what the 'flying customer' might require, and attempts, through the caterer, to interpret and respond to those wishes. Within the airline, individual groups of people will, in turn, be customers. The cabin staffs who serve the meals face a dichotomy. They often had had no input into the planning or preparation of the meals concerned, but are yet customers of the catering providers. They offer and serve a product

of which they have limited knowledge to a further customer. In one study, many cabin crews believed that decisions on the number of meals and the content of menus are made by the caterers, whereas in practice these decisions were made by the airline management. The last decade has witnessed the world's airlines creating demand and growing market share on the basis of discounted fares for both the business and leisure travel sectors. This has led to a number of weaknesses linked to revenue generation and profitability. Some airliners have their own catering unit and according to finances and the vision of its executive officers, they selling or expanding the catering component of the airline as per requirements of passengers.

1.5.3 Role of Caterers :

The main role of caterer is to deals with in–flight meals served to the passengers boarding the flight. These meals are prepared by catering companies and are served to passengers via trolley or tray. The catering company is bounded by various rules and regulations to offer passengers quality food and food products. An airplane's galley is occupied with in–flight meals, snacks and beverages which are stored, prepared and assembled. It is not limited to edibles; there are utensils, service ware, hygienic and miscellaneous items for assisting passengers. Airline catering agents are key person in making sure every flight is stocked according to specifications of an airline. Therefore catering agent is responsible for all aspects of catering line operations including loading and unloading catering equipment and supplies, driving large catering trucks and checking and verifying inventories of supplies and food products.

Caterers have two major roles **:** first is to prepare items not bought in directly from suppliers in a state ready for loading on board and second one is to assemble trays and trolleys. To do this flight production units are located on or near major airports. They also 'manufacture' some consumable food items and assemble others. There are two main reasons why menu items are made outside of airport–based flight kitchens **:** the first one is the cost of space and second is the cost of labour. Airport space is so often at a premium that it is not feasible for a flight production unit to produce all the meals needed for every class. Some caterers make first–class, or in some cases, business–class meals and outsource all other meal production. The flying or fare–paying passenger is considered as the final customer for whom the caterer ultimately works. Whether employed directly or contracted out, the flight provider works directly to and for the airline and in this respect complies with and responds the constraints placed on caterers. Some of the constraints include **:**

- Time required to serve
- Flight timing
- Length of flight
- Point of embarkation and disembarkation
- Travel class and ethnicity
- Budget allowed by the airline
- Seasonality of food
- Labour cost
- Number staff allowed
- Food consumption time

- Clearance requirements
- Odours
- Ability of the reheating or chilling
- Humidity and pressures that can affect the food

Caterers have a distinctive relationship with suppliers too. The standard of product is determined by airline. When products are purchased directly by the airline, caterers only charge for handling and storage of the product. The challenge for caterers is that the products are the property of the individual airlines served by the caterer, and products belonging to one airline cannot be used for another, even if the two airlines use identical products. Many airline companies are operating their own catering unit.

1.5.4 Role of Suppliers :

Before a flight is going to be dispatched, thousands of individual items need to be placed to make the trip safe and comfortable for passengers. Getting the right items on the right flight at the right time is a huge challenge, requiring precise coordination to be received by airline. A supplier can be a person, company, or organization who sells or supplies goods to either airlines or caterer. Sometimes airlines ordered directly to supplier for products required, in that case goods ordered is delivered to Flight production units. Direct purchasing is done for convenience of airlines. Direct contact of airlines with suppliers is due to **:**

- Continuous supply of identical supplies
- Regular receiving of goods at all units
- Readiness of the supplier to provide products that meet the contract specification
- Easy to negotiate a discount
- To link to the brand image of the product

Suppliers ensure prompt delivery of airlines requirements by ensuring standards of product they delivered. At the same time suppliers also need to ensure awareness about advancements and recent changes in product strategy as well as product quality. They have to be passionate about their services so that passengers can get exceptional experiences. They also inform about operational excellence and best practices across all functional areas related.

Airlines need to provide comprehensive catering services with consistency and best quality; supplier has to support airlines with same enthusiasm. Suppliers have two approaches to manufacturing their products.

1. Some supply airlines or caterers with their standard products and,
2. Other makes and supply specialist products specifically designed for the flight industry.

In the first instance, the manufacture of these products is likely to take place in a factory or plant producing many other products. These products for flight service have to be modified. Like, spirit manufacturers need to bottle their spirits in miniatures (small bottles) rather than their usual bottles.

The manufacturer is dedicatedly involved in food business than, they only concentrate on simply producing a cycle of food items, and they can produce in large amounts. Flight caterers or airlines can outsource it conveniently. The manufacturers can make items in volume at a lower unit cost than the flight

production facility can. The cost of labour to mass–produce meals is obviously cheaper at a good distance away from large cities where airports must exist. Initially, mainly frozen meals were outsourced in this way. Today, all kinds of specialist food items may be outsourced, such as canapés, ethnic meals, vegetarian items, patisserie, and so on.

1.6 EVOLUTION AND DEVELOPMENT OF INDIAN AVIATION INDUSTRY :

In later 1912 first domestic air route between Karachi and Delhi was formed Indian Air (It is the flag carrier airline of India, Initially, called 'Tata Airlines' and was named after its founder J.R.D. Tata.) services collaboration with a UK–based airline, Imperial Airways. Three years later, Tata Sons Ltd. – the first Indian airline – started a regular airmail service between Karachi (present Pakistan) and Madras (Now Chennai). 'Puss Moth'a small plane took off from Karachi on its flight to Bombay via Ahmedabad in 1932. At the control of the tiny plane was Mr. Tata, operating the first scheduled air service in the country. Till independence the development was dormant. 1948 can be consider as landmark year for the Indian aviation industry, when Government of India along with Air India set–up a joint company, Air India International. The advent of nationalism in 1953 brought the civil aviation sector under the control of the Indian government. It was a massive change that led to the domination of the aviation industry by government–owned airlines until the mid–1990s.

The Indian civil aviation industry was relatively small until the 1990s when the broader economic liberalization deregulated the civil aviation sector. The entry of private airlines and low–cost airlines resulted in a tremendous growth of the industry as the volume of passenger traffic more than tripled and freight more than doubled in the last decade alone. However, Indian aviation is currently facing a variety of challenges including high taxes, airport charges, maintenance costs, fare regulation, slot allocation, air space restriction and adherence to route guidelines. While the Indian government has enabled private participation in airport infrastructure, the growth in capacity seems to be lagging behind the demand. Policy changes aimed at increasing airport capacity, facilitating MRO services and generating investment in infrastructure are necessary. Now numerous private airlines have entered, with more and more emerging airlines. The Indian aviation industry is dominated by private airlines and low–cost carriers like Indigo Airlines, GoAir, and SpiceJet. Indian Airlines, the giants of the Indian air travel industry, was relevant no more – it gradually lost its market share to these private airlines. With the East and West correlation 'low–cost' air connectivity and rapid economic development can be seen. Demand of low–cost airlines hence increased. In 2016, UDAAN (Ude Deshka Aam Naagrik) scheme was launched to encourage domestic flights and regional connectivity improvement that helped

and helping in further growth in Indian aviation industry. This scheme is benefiting many destinations to be made operational as well. The evolution of the aviation industry in India created huge job market. In 2017, Indira Gandhi International (IGI) Airport (Delhi) became the first airport in South Asia to handle six crore passengers.

1.6.1 Flight Catering Development :

At that time the International carriers operating through India had no Flight Kitchens, nor were there any public/private flight kitchens, they largely depended on Airport Restaurants or hotels situated in nearby cities to cater to their requirements. This system was continued until the industry was nationalized and was formed into separate corporations; one for domestic routes (Indian Airlines) and the others for International Flights (Air India). Modernization and expansion of the fleets increased the carrying capacity of the passengers in both the airlines. It was necessary to improve & expand the catering services to provide passengers with a service compatible with the cost of the airline ticket.

Several Flight Kitchens have been established in Delhi, Mumbai & Kolkata to cope with the needs of International Carriers. Air India floated a subsidiary company known as HCI (Hotel corporation Of India) with a view to operate flight kitchens known as Chef Air and also to accommodate travellers in five star category hotels at major airports (The Centaur group of hotels). Indian Airlines has also launched a subsidiary company known as Allied Services in order to establish flight kitchen at Airports where there are no HCI flight catering establishments.

❑ **Check Your Progress :**

1. In how many years air transport business gets doubled in its size.
   (a) 10 years (b) 15 years (c) 20 years (d) 25 years
2. In 1919 first time flight catering was done between _____ & _____ city.
   (a) Delhi & Mumbai (b) Milan & Paris
   (c) London & Madrid (d) London & Paris
3. Which are the constraints of catering on–board
   (a) Flight timing (b) Length of flight
   (c) Travel Class (d) All of the above options
4. Flag carrier airline of India initially called as _____.
   (a) Air India (b) Indian Airline
   (c) Tata Airline (d) None of the above option
5. UDAAN scheme was launched in _____.
   (a) 1996 (b) 2006 (c) 2016 (d) 2017
6. The first in–flight kitchens were established by United Airlines in _____.
   (a) 1926 (b) 1936 (c) 1946 (d) 1956
7. First airport in India to handle 6 crore passengers
   (a) Delhi (b) Mumbai (c) Chennai (d) Kolkata
8. Wright brothers formed American Wright Company in _____.
   (a) 1899 (b) 1909 (c) 1919 (d) 1929

1.7 LET US SUM UP :

Airline food was not traditionally viewed as being particularly appetising, but that perception is definitely beginning to change, as carriers invest more time and effort into delivering high–quality cuisine. The transportation boom in the 20th century paved the way for a new way of eating **:** in–flight catering. There was a lack of space, weight was limited and, before the invention of the pressurised drinks. Since the advancement of technology airline food has changed from being a cold, frugal meal eaten from a tray to a gourmet meal until 1960s. It has been seen in recent decades that airlines have begun to invest heavily in delivering quality food on–board on a regular basis with compassion. Now carriers have recognized that food is a fundamental part of the in–flight experience, so far more effort has been invested in meal and menu planning. Several airlines have sought assistance from renowned chefs in an attempt to improve their food. The interaction of the players, the airlines, the caterers, the manufacturers/suppliers, and the distributors is the key to providing quality food service to passengers on airline carriers.

The evolution and growth of the aviation industry in India can be classified as a) Growth in the pre–privatization era b) Growth in the post–privatization era. The nationalized Indian aviation industry has been opened to private players in the early 1990s. With the world becoming a global village the aviation sector is bound to grow. The government policies have a definite effect on the aviation industry. India's civil aviation industry once comprised the two national carriers, Air–India (AI) and Indian Airlines (IA). After the privatization about 20 private operators took to the skies. But they became victims of high import duties on spares and fuel and low passenger demand leaving a few survivors. Jet Airways (JA) and Sahara Airlines (SA) are the two significant survivors. These private players have initiated price wars and new marketing strategies to lure the increasing number of customers.

1.8 ANSWERS FOR CHECK YOUR PROGRESS :

❑ **Check Your Progress 1 :**

1. (b),	2. (d),	3. (d),	4. (c)
5. (c),	6. (b),	7. (a),	8. (c)

1.9 GLOSSARY :

À la carte : style of menu where individual dishes listed with separate prices

Cabin crew : flight attendants, purser and assistant pursers.

Commissary : The term originated in the navy. It is also used in in–flight catering to refer to all of the operations and elements that contribute to a passenger's comfort.

Finger food : food meant to be eaten directly using the hands, in contrast to food eaten with a knife and fork, spoon, chopsticks, or other utensils. Examples include Roasted meat (chicken or beef), Spring roll, Cocktail Samosa, Arancini, Chips, Hot dogs, Tomato Panini etc.

Fragmentary business : In market where no one company has enough influence to move the business in a particular progressive direction. The market

may consist of several interrelated companies that compete with each other and large enterprises.

Freight Tonne Kilometres (FTK) : Freight Tonne Kilometres is a measure of how much freight business an airline gets. One FTK is one metric tonne of revenue load carried one kilometre. The sum of FTKs for every flight stage flown by every aircraft over a period is the FTK of an airliner over the period.

Galley kitchen : A galley kitchen is a long, narrow kitchen that has base cabinets, wall cabinets, counters, or other services located on one or both sides of a central walkway. The countertops can be interspersed with appliances like fridges, sinks, cabinetry and other functional items.

RPK (Revenue Passenger Kilometres) : Sum of the products obtained by multiplying the number of revenue passengers carried on each flight stage by the corresponding stage distance. The resultant figure is equal to the number of kilometres travelled by all passengers.

1.10 ASSIGNMENT :

1. Note down the name of 10 national carriers from each continent (except Australia)
2. Search about the history of Low Cost Carrier Airlines.

1.11 ACTIVITIES :

1. Prepare a quiz of 30 questions based on above assignment (MCQ with 4 options) and put it on your Facebook to know the response of your connection.

1.12 CASE STUDY :

The Brazilian Aircraft Manufacturer's Turnaround and Growth

Brazil–based Embraer was the fourth largest aircraft manufacturer in the world behind Airbus, Boeing, and Bombardier Aerospace. Embraer was set up as a government company in 1969, and privatized in 1994.

This case examines Embraer's turnaround and growth after its privatization. It discusses the steps taken by Mauricio Botelho (who became the CEO after the privatization) to return the company to profitability, as well his handling of various strategic and human resource issues during and after the turnaround. The case then explores Embraer's entry into the regional jet market, where it had to compete against Canadian aircraft major Bombardier.

It also talks about Embraer's use of international strategic alliances to gain expertise in aircraft manufacture, and its aggressive marketing of its new regional jets to various airlines.

A section of the case discusses the various facets of Embraer's competition with Bombardier in the regional passenger jet market. The implications of the dispute between the two companies – which went before the WTO – and its impact on the political and economic relations between their home countries are also mentioned. The rest of the case includes a commentary on Embraer's future prospects, where issues like airline scope clauses, the resurgence of turboprops in the early 2000s, Embraer's problems with its E–Jets, and the company's excessive dependence on revenues from the export of passenger jets are

discussed. The case ends with a description of Embraer's restructuring efforts in early 2006, including the company's new capital structure.

❖ **Issues :**

- To examine and understand the issues involved in the turnaround of a company
- To understand the differences in the business environments of developing and developed countries
- To analyze the competitive advantages and disadvantages of an aircraft manufacturer based in a developing country
- To understand the strategies adopted by a company based in a developing country to compete in a highly volatile global market

1.13 FURTHER READING :

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UNIT 02 *The Flight Catering System*

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES :

After reading this Unit we will be able understand :

- Flight Catering System
- Operational Issues and Modern trends

2.1 INTRODUCTION :

System is very effective tool for better and comprehensive management of anything. So in–flight catering too required a determined system. It is much required with the process of worldwide acceptance and valued preference for in–flight catering. To manage the core elements of in–flight catering, these elements are noted as the concerns related to the growing numbers of customers, the expanding markets, catering specification. The speculation, process of ordering and on–time delivery of the materials, assembly of the products or production in particular system is required at each point of service. There is also the involvement of transportations, uplift, on–board storage and the facilities for on–board storage. Addition of necessary services and the activities related to off boarding and wash–up are some of the necessary elements that are needed to be a part of the in–flight catering system for meeting the growing demands of such services. Systematic connection between these elements and the way these get interwoven in offering a determined structure to the process of in–flight catering for any airline.

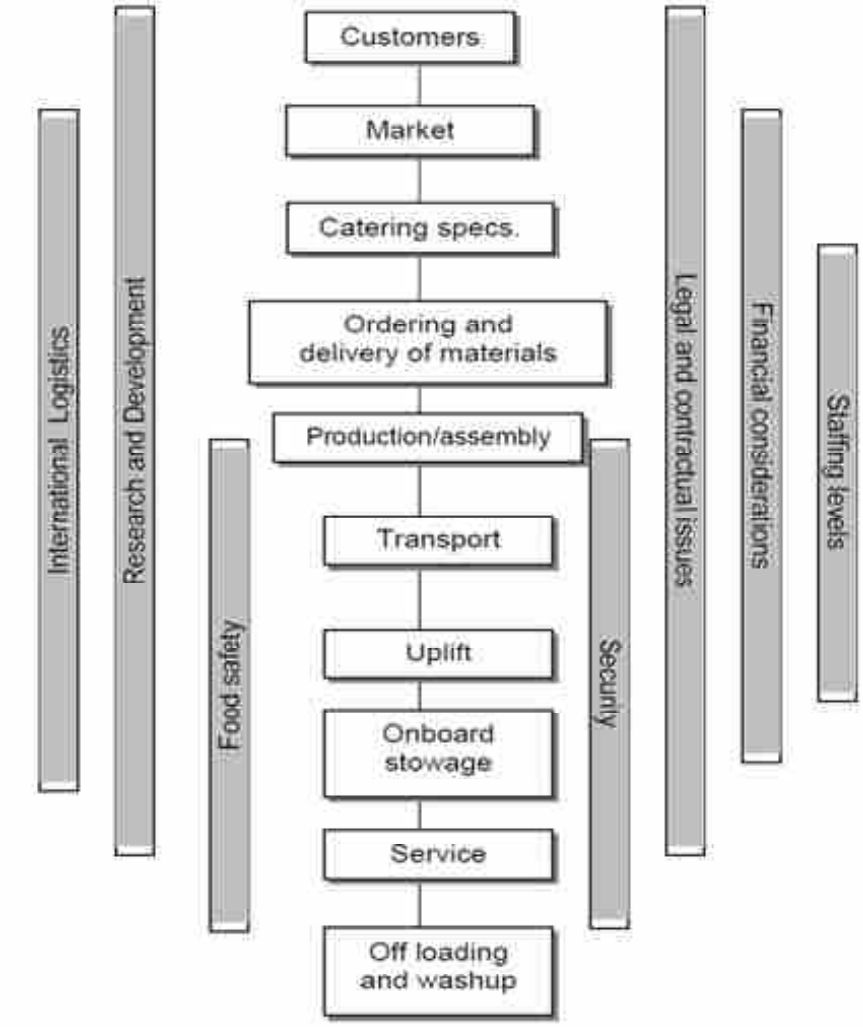
2.2 THE FLIGHT CATERING SYSTEM :

Flight catering is considered as one of the most complex operational systems in the world. Complexity of system can be assumed when a large–scale catering production unit, may employ over hundreds of staff to produce meals for thousands of passenger per day. However during peak periods both the figures are increased. A large international airline company may have hundreds of take offs and landings every day from just their main hub and so on. These facts and others like them make flight catering unlike any other sector of the catering industry. While, it can be said the style of service may have similarity as of other food serving unit. food is served on trays to airline passengers bears some resemblance to service styles in restaurants or cafeterias, the way food is prepared and cooked increasingly resembles a food manufacturing plant rather than a catering kitchen. The way food and equipment is stored resembles a freight warehouse, and the way meals and equipment are transported and supplied has a close affinity to military–style logistics and distribution systems.

As consistency, quality, and prompt delivery are some essential features of in–flight catering system ensures the service at each level of delivery and process. To manage the catering and logistics operations, carriers have to depend on catering service providers. The logistics of these service materials between suppliers, warehouses and the caterers differ from the traditional material flow in other industries between the manufacturers, suppliers, and customers. There are very less chance to give flexibility in timing in this catering business. The flight can tolerate minimal flexibility relating to scheduling issues. Continuous changes in the schedule can undermine the confidence in the system and result in disruptions in the production or delivery systems. There are various determinants are correlated with schedule instability of the airline catering operations. Logistic, supply chain, quality of service, quality of meal, lot–sizing rules etc. are some of important operational determinants and have different impacts (both positive as well as negative) on service quality at both regional and flight range levels. It is very important to identifying cruciality of these operational determinants which may be different for different clients, regions or destinations. By knowing these ranges, help in understanding improvement requirements to ensure better operations and service quality. There is a significant correlation between internal operation and customer relationship, which affect the work efficacy overall.

It is just an outline of the process flow in–flight catering; these operations are highly complex and have a number of alternative configurations. It is this model that provides the structure for this. It is very important for Flight caterer to well verse with an understanding of the number of passengers and their needs.

This information can be collected by doing market research as well as actual passenger behaviour can be observed and documented for further references. By analysis of this information, airlines need to consultation with caterers and suppliers and develop the product and service specifications. These specifications define exactly what food, drink and equipment items are to be carried on a particular route for different class of passengers.



Meal production unit can be considered as heart of the flight catering system, which is warehouse, food manufacturing plant, kitchen, and assembly belt. After forecasting of passenger numbers for a flight, the production unit has to plan and execution to produce meals on tray and non–food items ready for transportation to the aircraft. For transportation specialist high–loader trucks is required that enables trolleys to be rolled on and off aircraft. Once loading is done trolleys and other items need to bestow on board to ensure the microbial safety of edibles. The security and safety of the crew, passengers, and aircraft is essential concern for airlines. For this it is important to ensure all the factors during loadings. Time is also an important factor through, the cabin crew carry out the service of meals, snacks, and other items at designated time. On arrival at its destination, aircraft is stripped of all the equipment and trolleys, which are then returned to the production units for cleaning and re–use. System is required for an effective and positive relationship between effective internal operations. A positive relationship with supply chain partners, suppliers, customers and airlines can be achieved by this. Internal operations include **:**

- Reliable service delivery system
- Materials/services harmony
- Relationships with customers
- Flexible system planning
- Competent staff planning
- Operations management

- Supplier relationships
- Flexible delivery system for suppliers
- Effective information and communication infrastructures
- Availability of information by customers well in advance
- Inventory handling management
- Cost effectiveness and viable costing

2.3 INTERNATIONAL OPERATIONS :

The level of services provided by airlines especially for international operations required skilful and competent operational person who need to integrate and adapt the outcomes of functions within and outside the airline. The managers of these operations also have to coordinate and cooperate with both staff and other related outsourcings.

With increasing globalisation companies have been able to and started and expended business outside their native. These companies are known by various names like multinationals, global businesses, transnational companies, international firms etc. Airlines were global before much of the business world knew global existed. As the routine flights started by mid of 1930 International travel quickly became the most romantic, highest–margin segment of the airline industry and it remains so today. However, Chalk's Ocean Airways can be said first who started first international flight in 1919 carrying passengers between Florida and the Bahamas in pontoon–bottomed seaplanes. Now for airlines, globalization is not an opportunity, but their gravest threat. The brand, the customer basis and the position at a hub are protectable strategic resources of an airline. The core of Airline operations is networks and therefore network management. Different strategies rely on a different extent of network effects. The use of network effects also differentiates business models. Different types of planes lead to different concepts of airlines.

Airline operation is a group of many different services that have been brought together. It is a combination of operations i.e. air service, maintenance, ground handling, and catering. Whereas some functions are outsourced, like aircraft maintenance, repair, and overhaul (MRO). To reduced overhead cost airlines need to focus outsourcing of ancillary activities like IT, food distribution etc. That also reduce the burden to manage staff and machinery involve in these services. We can't avoid these services although it ancillary service for aircraft but for passenger it is part of service. Between customer satisfaction and dissatisfaction there is a thin line. For instance you forgot or delayed the service of water or tea or passenger didn't receive the food what he ordered during booking, your passenger may angry and this issue will be discussed among his/ her friends this is what image we are going to create in the mind of a person who has not visited our service yet. Perception plays crucial role in satisfaction or dissatisfaction of human being.

2.4 CHARACTERISTICS OF FLIGHT CATERING :

Food and in–flight meals have always been a challenge for airlines, yet it's one of the first features for passengers to comment on when they have both a good and bad experience. Before take–up of flight crew need to ensure loading of foods, beverages and other amenities at designated time. During journey the

cabin crew serve meals, snacks and other items and after arrival at its destination, equipment and trolleys are stripped off, it is then returned to the production units for cleaning and re–use. Passenger satisfaction and loyalty is utmost important for airlines. The typical catering includes :

- Meal served to in commercial airliner
- Served to passengers on board
- Quality Foods
- Healthy and Nutritious Food On–board
- Branded Farm Produce
- Simple to Elaborate Meal Option
- Similar to luxurious Restaurants on the Ground
- Cultural and Religious Diets
- Complimentary and Paid Multiple–Course Meals
- Trendy Culinary
- Locally Procured Food
- Lack of flexibility in terms of garnishing and other presentation is limited due to weight concern
- Lack of chances of Deviation and innovation of food
- Limit time
- Lose of taste food at height
- Limited choice of meal
- Wastage of food is more

2.5 OPERATIONAL ISSUES AND MODERN TRENDS :

Recent trends and innovations are required for growth and development of any industry. So as it is in airlines industry too. Technology is always at the centre to the air transport industry. With increase in technology, modern aircrafts are more sophisticated and focus on safety, comfort and more efficiency. Trends can influence the supply and demand for both international and local levels. Innovation and setting and improvising trends is an important considerations in the development of an aviation system plan.

Congestion in air traffic is main region for flight delay. The challenges facing the air transportation sector extend beyond the need to alleviate and enhance service quality and coverage. An important challenge for air transportation system is safety and environmental compatibility. It also has been claimed by some researcher that due to aircraft automation pilots are overreliance on automation systems which is becoming life–threatening as technology becomes more complex.

Commercial activities are related to external forces. These forces inevitably cause an industry to change and adapt over time. In order to identify the relevant factors that may affect the growth and development of industry, the industry need to research and develop new policies and new products and services as per requirements of the consumer who actually uses the product or services. These researches have to be focused and well organised. There may be certain points every business needs to focus them are Political factors, Economic factors, Social

trends and behaviour, Technological advancements and, Environmental concerns these factors not need to compulsorily fall in one category only but more than one of these categories. The creation of a single currency in Europe is an economic issue, but at the same time political and has social effects too. Airline catering services booming day–by–day. Even after the pandemics, such as COVID–19, industry is going to revive with full fledge.

Rise in air passenger traffic increase food demand. Increase in popularity of gourmet food, catering competition hence increase and it leads to competitive strategy for service differentiation among airlines. Due to this competitions and increased commoditization of airline services diverting focus on opportunities for targeting walk–ins. As new value added services in–flight services can find revenue opportunity in Food and fine dining, Wi–Fi connectivity and on–board entertainment, duty–free shopping. It has been observed in last decade consumer demand for high quality, healthy food while flying is increasing and hence it can help in boosting the prominence of food and drink as vital on–board services with the potential to impact flying experience. When it comes to passenger satisfaction and retention, food is also an important factor. Airline companies are increasing focus towards the importance of food and beverage in roping in repeat passengers and retaining customers on international routes, offering food and beverages unique to company's culture. Now the airliners provide flexibility in meal ordering and other factors as important growth drivers include the growing trend of airline food services to meet diverse consumer tastes and preferences that results prominence of **:**

- A La Carte meals options
- Mobile–apps and online meal order
- Automation in catering management solutions
- Mini–meals and nutritious snacks
- Locally sourced ingredients
- Innovations in on–board meal menu
- Modern cooking techniques

2.5.1 New Trends In–Flight Catering :

- Locally–Sourced Meat and Seafood
- Inclusion vegetables
- Heating option and hot food
- Ethnically foods
- Locally–Grown Produce
- Signature cocktails and food

❑ Check Your Progress :

1. What is considered as heart of the flight catering system ?

   (a) Meal Production (b) Meal Logistic

   (c) Both (a) and (b) option (d) None of the above options

2. Internal operations of flight catering system include.
   (a) Service harmony
   (b) Reliable delivery system
   (c) Healthy relationship with suppliers
   (d) All of the above options
3. Full form of acronym MRO is :
   (a) Maintenance, Repair and Overburden
   (b) Maintenance, Reschedule and Overhaul
   (c) Marketing, Repair and Overhaul
   (d) Maintenance, Repair and Overhaul
4. _____ is main region for flight delay.
   (a) Congestion (b) Catering
   (c) Security (d) None of the above option
5. New value added in–flight services include :
   (a) Wi–Fi connectivity (b) On–board Entertainment
   (c) On–board duty free shopping (d) All of the above
6. In–flight meals are :
   (a) Complementary (b) Paid
   (c) Both (a) and (b) options (d) None of the above options
7. Airline operation is a group of different services like :
   (a) Air Service (b) Maintenance and Ground Handling
   (c) Flight Catering (d) All of the above options
8. _____ airways was the first international flight in 1919
   (a) Chalk's Ocean (b) Pacific Ocean
   (c) Wright Bros (d) None of the above options

2.6 LET US SUM UP :

Airline caterers are extensively upgrading the satisfying needs and specific range of eating habits, with meeting high logistical demands and production standards. With the digital advancement and transformation, system catering and airline catering operators are utilizing new technologies to meet this diverse range of challenges. The success of in–flight catering is completely depending on customer satisfaction. It can be achieved when the customer attain right kind of food and ambience on–board. The element of excellence counts a lot in the performance of in–flight catering. Though there are additional factors, yet catering is the main element. Effective meal planning and delivery, right budgeting, load planning, galley management, addition of cost–effectiveness, etc. are crucial and need to be systematic. Combined efforts of all the stakeholders remain vital in system and implementation of airline catering. At each of the stages of the flight catering operation, there are unique features. Food is prepared on the ground is consumed in the air. Meanwhile we need to understand customers and their needs; the prime motto of passenger is travel not eating. There are some food and drink items which are not suitable to consume in pressurised cabins and above the ground. Tray service predominates as the passengers are seated in rows.

Large scale production is required and then transportation is done on moving tray meals from production unit to aircraft and then storing on board is based around modular trolleys These challenges have always existed since the earliest days of commercial passenger air travel. Indeed, the industry invented or adopted a large number.

2.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. (a),	2. (d),	3. (d),	4. (a)
5. (d),	6. (c),	7. (d),	8. (a)

2.8 GLOSSARY :

Loading bay : Also called loading dock it is a space or area from where food and other amenities are loaded and unloaded into aircraft.

MRO : Maintenance, Repair, Overhaul is the repair, service, or inspection of an aircraft or aircraft component to ensure safety and standard of aircraft.

Walk in : person without prior reservation.

2.9 ASSIGNMENT :

1. What are the important factors of airline operations ? Explain.
2. Flight catering system includes different aspects. Enlist and explain.
3. What are the characteristics of flight catering system ?

2.10 ACTIVITIES :

1. Make a report on Flight Catering System on any 1 airline company of India.
2. Analyse any one among Singapore Airline, Emirates, Cathay Pacific Airline and find the reason of its success.

2.11 FURTHER READING :

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2. Westkämper E, Zahn E (2008) Wandlungsfähige Produktionsunternehmen. Springer, Berlin

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UNIT 03 *Pricing of Flight Meals*

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

After reading this chapter we will be able understand :

- Flight catering pricing techniques
- Flight Class and Type

3.1 INTRODUCTION :

Eating is not just ingesting food into body but, texture, appearance, and taste, of food are the main factors reflecting catering quality. Hygiene and Safety is major concern along with timeliness and other factors. Hygiene and safety consideration not only involve human capital but cost too. Initially passengers were only served plain sandwiches and tea as the turbulence of the low altitude flights restricted equipment to minimum level. As flight equipment became lighter and advanced suitable to accommodate longer distances at higher altitudes.

Normally food is cooked at ground kitchen (also called production unit) and hence it is sent to airplane where flight attendants re–heat the meals and service on the plane. The production operation mode is similar to that of central kitchen of banquet of the hotels. Similarity is not just only basis of amount of cooking but other aspects, such as meal designing, planning, preparation, management, transportation, marketing, and customers receiving, services as found in central kitchen.

3.2 PRICING FACTORS :

The airlines meal design consider production cost, method of cooking, raw material used, taste, garnishes and appearance, hygiene, safety and security, the route and flying time, the tableware limitation, and the management, and consumer surface including. Consumer constructs include fine dining, consumer recognition differences, internationalisation guest level, and cabin configuration. The range of pricing strategy and methods are subject to so many factors. The approach for pricing may be multi factored method or single factor. In–case of single factor method, minimum data collection and manipulation is required whereas multi factor method required more data and careful analysis.

Cost Consideration while pricing a food item cost in menu of various aspect to be considered. These things could be cost of raw materials, cooking cost, packaging and serving cost, labour involve in it, transportation of final product etc.

Cost control is an integral part of menu design so, it is necessary to take into account catering cost, procurement, menu pricing, and other financial and marketing situations.

Production cost influenced by production method also. Airline caterers provide services to both multinational as well as local/domestic airline companies. Since there is larger number of passengers and the amount needed is huge. Storage and cooking methods, as well as delicacy of meal is necessary to take into account for airline meals in order to meet the needs of different routes, waypoints, and departure time and so on.

a. **Large daily supply :** the supply line of airline kitchens has to irregularly provide tens of thousands of different forms of airline meals in a daily manner. Advance purchasing of raw material and subsequent consumption is required. It required amount of money to purchase adequate amount of dining utensils and other, so while pricing an item it is taken into account.

b. **Storage method :** meals need to be pre–prepared on land, and then rapidly freeze them for storage to maintain the freshness of ingredients to wait for the time for flight attendants to take them. There are various types of refrigeration units required. Operational and maintenance cost of these units is considered as it is directly related to these meals. Storage of different raw materials required different conditions for example : wines, spirits and other packaged drinks required dark rooms where no or lesser sunlight can reach, dry ingredients need to be save from rodents and so on. These conditions increase money expenditures and maintenance. While storage methods involve cost so this factor is also considered during pricing.

c. **Cooking methods :** the taste of meal is not as delicious as much it should be (because of height our test bud changes and food become blunt as compare to land) to maintain the colour, aroma, flavour, and appearance of ingredients, and also consider the quality after reheating, adequate cooking methods, such as blanching, deep–frying, and steaming, as well as seasoning of various ingredients are very important. To balance these things chefs need to plan and executed. They are highly specialised chefs and hence highly paid.

d. Delicacy : due to the differences in cabin classes, the style, amount, and cost of cuisines may be different. The styles of meals of first class and business class are usually more diversified than those of economy class. The selection, plating, and dining procedures of ingredients are also more complicated than those of economy class.

❖ **Difference in Ground and Flight Catering Costing :**

In ground–based catering, pricing is done on the basis of raw material cost, labour and overhead costs with sufficient margin that leads to overcome any overlooked cost. However, In–flight catering, price has to be determined on the basis of calculation of many cost involve in it. Separate calculation of all the elements need to be done in order to get cost of individual item. For instance labour cost may depend on the factor whether and seasonality.

That item is simply handled or processed within the flight production unit.

Some food like, casseroles or stews may be outsourced in that case handling costs only need to considered whereas if food is prepared in the flight kitchen, production, processing and handling costs need to be considered. Therefore separate costing to be done for stock–handling and warehousing, production, tray lay–up, transportation, and ware–washing and so on.

The meal planning involves various considerations that affected by :

i. the time of flight,

ii. length of flight,

iii. point of embarkation and disembarkation,

iv. ethnicity or religious view of passengers,

v. seat class (economy, business or first),

vi. budget allowed by the airline,

vii. price of food,

viii. seasonality of food,

ix. cost of labour,

x. time requirement for serving, number of attendants required, consumption timing, convenient to eat, space requirement to serve and eat,

xi. clearance time and efforts required,

xii. customer demands,

xiii. odours of food the cabin,

xiv. re–heating or freezing capacity

3.3 VIABILITY :

Flight catering can be said as a complex food service system where a wide range of airlines are catered. Meal on–board to passengers is a major concern of service. As food is an integral part of any life–system. Caterer/ airlines ought to provide meal on board along with other amenities and it continues further. The cost involve in it need to be charged (either directly or indirectly) from passengers who avail this. Pricing is critical as it also depends on fluctuation of market of other segments too. The market for the flight product appears to be becoming ever–more price sensitive and more value conscious, indicating that those flight caterers who wish to survive and increase their profitability in a much more

competitive environment will need to concentrate even more on costing and pricing. Successful pricing methods are able to contribute to establishing a 'competitive edge' over very aggressive and increasingly margin–conscious rivals.

3.4 TRENDS AND BEHAVIOUR :

With increase in airlines companies and freelance caterers it is becoming more competitive environment in the industry. Significant growth has been seen with increased demand. Now, airlines are asking for higher quality food at lower prices so that they can compete in price strategy. In–flight caterers and suppliers are therefore exploring innovative and diverse ways of remaining competitive. Diversity on–board such as buy–on–board, buy–at–the gate, give away–at–the–gate and offering a picnic bag rather than tray–set are some experiments airlines now a day opting.

3.4.1 Improvement in Flight Kitchens :

For smooth and hustle free operation, reducing cost now become necessary for caterers. With the external pressures from customers and competitors, flight catering firms are seeking to reduce their costs by operating more efficiently. The concepts of lean or agile manufacturing and just–in–time production now become popular. The approach being adopted varies from firm to firm, and from plant to plant, but some clear trends are evident. These are :

- Processing time has been reduced to 8 hours from round the clock in some plants. This reducing cycle time has been achieved by taking 'waste' out of the system – wasted time, wasted movement, too much stock, unnecessary transportation, and etc.
- An industry norm for each aircraft need 3.5 sets of equipment (one set on the plane, one being cleaned at the point of departure, one ready for loading at the point of arrival, and a half set to cover losses and breakages).By reducing cycle time, global caterers have significantly reduced the total amount of equipment in the system
- Less equipment frees up space in plants to enable revision to process layouts, simplify inventory control, and generally use space more efficiently
- Inventory management is switching to the kanban system, i.e. standard of each inventory item
- Tray assembly is switching from conveyor belts to work stations based on kanbans
- Non–standard catering, such as for special meals, is being outsourced to specialist suppliers

3.5 PHYSIOLOGY OF TASTE IN FLIGHT :

When people flew so rarely repetitiveness of the food served on–board got unnoticed. Changing of the menus did not really affect the client behaviour, but now it is impossible to do same as the passengers noticed and compare minute things. At approximately 3000 ft. the air pressure drops and humidity lesser than 12% the cabin become like dry desserts. The combination of dryness and low pressure reduces the sensitivity of your taste buds to sweet and salty foods by around 30%, so as passengers feels tasteless and blunt food. So it is important to balance the taste.

3.6 FLIGHT TYPE AND CLASS :

Generally there are four cabin classes economy, premium economy, business, and first class. The service classes of economy, premium economy, business, and first class are further divided into fare classes, which appear as a letter on ticket. Each seat on an airplane is put in a fare class, which each come with their own set of rules and price.

Economy : normally this class do not provide any type complimentary food however some airlines give free snacks and beverages and in–flight entertainment systems.

Premium economy : some airlines have this category of ticket which is basically economic class with better facility than economy class. Complimentary food is provided here too which better than economy.

Business : Business class is a completely different class from economy, and airlines have increased the quality in this category. In this category, full meal service and in–flight entertainment etc. are provided. In some case personal mini–bar, multi–course meals served on fine china and a full bar area complete with bartender and canapés are provided.

First Class : it is the most luxurious class of any flight and experience varies on the airline. Some airlines even provide a 3–room suite with living room, bedroom with a double bed and private bathroom with shower. The food is serviced on laid cover along with wines and so on. The service is done by highly trained crew, who is able to anticipate a passenger's every need. The standard of food leaps up a notch up too, with many menus and dishes created by Michelin starred chefs.

❑ **Check Your Progress :**

1. Cost of food item consists :
   (a) Cost of raw material (b) Cooking cost
   (c) Packaging and serving cost (d) All of the above options
2. Cost control takes into account :
   (a) Menu Pricing (b) Procurement cost of raw material
   (c) Both (a) and (b) options (d) None of the above options
3. Separate costing to be done for stock handling, warehousing, tray lay–up and so on in :
   (a) In–flight catering (b) Fine dine catering
   (c) Take away catering (d) None of the above option
4. Flight catering market is becoming more price _____.
   (a) Sensitive and value conscious (b) Independent
   (c) Both (a) and (b) options (d) None of the above option
5. In–flight caterers and suppliers are exploring innovative ways to remain competitive to sell meal are :
   (a) Buy on–board meals (b) Buy at the gate
   (c) Offering a picnic bag (d) All of the above options

6. In–flight processing has been reduced to _____ hours from round the clock in plants.

   (a) 8 (b) 12 (c) 16 (d) 20

7. An industry norms for each aircraft need to keep _____ sets of equipment.

   (a) 3 (b) 3.5 (c) 4 (d) 4.5

8. Different flight class are :

   (a) Economy and Business class (b) AC I & II class

   (c) Sleeper Class (d) None of the above options

3.7 LET US SUM UP :

The aviation industry need for most dynamic pricing strategies which call also be termed as demand–based pricing and it is highly required. It has to be followed as per demand for instance during high demand like festive seasons or other times of, the airline prices are often at its peak, and during the off–season, the same tickets are priced at much lesser rates. The food cost also depends on these circumstances. Apart from this, there are several other pricing strategies that airline companies often follow.

The in–flight service meals now are seen as part of marketing strategies in attracting business or leisure travellers. Taste, freshness, appearance of in–flight meals served and menu choices are important to the airline passengers, especially for the long–haul flight. Food not only contributes to the prediction of the airline passengers ? levels of satisfaction but also to the other factors that slightly influence passengers ? re–flying intention. Airline companies therefore should not ignore this element but should see it as an opportunity to create more attractive and acceptable in–flight meals along with other matter such as marketing tools in attracting passengers to re–flying. In–flight meals are a contentious issue regarding the freshness and taste of the food when in the air. Cost of an economy class meal is less as compare to a business class meal is much more, as it has to include the china, cutlery, glass and napkins as well as the tray and seasoning. Service quality has become a centrepiece for airline companies in vying with one another and keeps their image in the minds of passengers. Many airlines have pushed service quality through service personalization which includes both ground and on board especially from the viewpoint of retaining satisfied passengers and attracting new ones. Besides those, in–flight meals/food service is another important aspect of the airline operation. The in–flight meals/ food services now are seen as part of marketing strategies in attracting business or leisure travellers.

3.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. (d), 2. (c), 3. (a), 4. (a)

5. (d), 6. (a), 7. (b), 8. (a)

3.9 GLOSSARY :

Canapé : a finger food consisting of a small piece of bread, puff pastry, or a cracker topped with some savoury food, eaten in one bite.

Complimentary Meal : Provided free of charge or without any extra pay.

3.10 ASSIGNMENT :

1. What is difference between costing and pricing of product ?
2. What are the major components of costing of food items ? Explain it with example.
3. What are the different type and classes of flight ?

3.11 ACTIVITIES :

1. Prepare a cost sheet for catering 100 people full course menu. Consider all cost of preparing food and serving also.

3.12 CASE STUDY :

❖ **Airline meals for VietJetAir :**

VietJetAir, founded in late 2011, has established itself as Vietnam's second biggest airline. The low–cost carrier operates a route network to many national airports and more than 30 regional destinations in Asia. In 2016 VietJet Air carried 14 million passengers on domestic and international flights. Dussmann Service provides in–flight catering.

❖ **The Challenge :**

Each day, VietJetAir carries tens of thousands of passengers on domestic and international flights. Among other services, the airline aims to provide first–class meals at competitive prices on each flight. Large numbers of standard meals must be prepared, packaged and distributed in accordance with daily changing passenger numbers and the airline's schedule. For more than five years Dussmann has proved itself a reliable partner.

❖ **Business Needs :**

- Standard preparation and packaging of hundreds of meals each day
- High flexibility with respect to the daily changing number of passengers at short notice
- Punctual delivery
- Compliance with strict hygiene regulations and maintenance of storage temperatures
- Specific kitchen design to facilitate efficient operations

❖ **Improvements and Innovation :**

The Dussmann Service central production kitchen in Ho Chi Minh City is around 8 km from Tan Son Nhat International Airport. At the start of the contract, a separate section was built to accommodate the production line and the equipment needed to conform to the requirements of VietJetAir.

The safety of passengers and staff is a very important to Vietjetair and food safety is a key requirement of catering operations. Dussmann catering employees undergo special training on hygiene and food handling. Risk assessments are made, processes are monitored and recorded in accordance with HACCP principles and all procedures are subject to internal audits and checks by external supervisory authorities.

To provide customers with freshly prepared food, meals are quickly chilled after preparation and packaged on specially designed meal trays ready for

transportation. They are delivered in thermally insulated boxes with a core temperature of 2–5 °C for regeneration in the aircraft before service.

Dussmann produces between 1100 to 1300 meals each day. Notification of the exact number of meals required is given by VietJetAir less than two hours before delivery. Dussmann Service plans overnight meal production based on the orders of the previous day and final adjustments are made when the order is received. There are catering staff on standby to facilitate additional production whenever necessary.

❖ **Benefits for the Client :**

- VietJetAir can concentrate on its core business.
- The catering process is organized by specialists who understand how to produce culinary quality whilst ensuring maximum food safety.
- The risks associated with meals for fluctuating passenger numbers are taken on by the service provider.
- By producing excellent meals, Dussmann contributes to the satisfaction of VietJetAir passengers.

3.13 FURTHER READING :

1. Jones P (2004) Flight catering, 2nd edn. Butterworth–Heinemann, Oxford
2. Berghof R, Schmitt A (2005) CONSAVE 2050 constrained scenarios on aviation and emissions–executive summary. German Aerospace Center (DLR), Cologne

■

UNIT 04

Passengers Appetite and Behaviour

UNIT STRUCTURE

4.0 LEARNING OBJECTIVES :

After reading this chapter we will be able understand :

- Provide an understanding of how the physiology of passengers changes when flying
- Develop an understanding of some psychological aspects of flying
- Examine the implications of changes in passenger behaviour for flight catering
- Passenger food acceptance

4.1 INTRODUCTION :

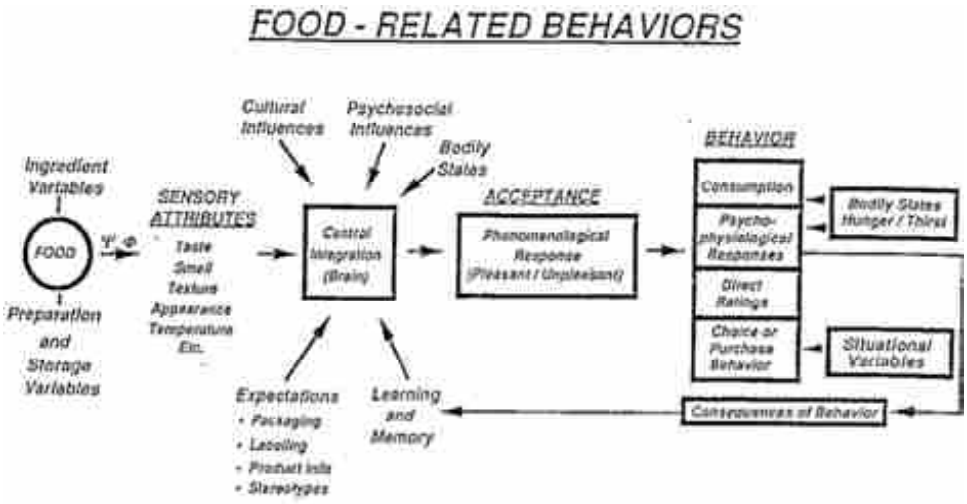
At high altitudes our taste buds don't work as it works at ground hence food taste changes at high altitudes. It is partly because in conditions of very low humidity, our sense of smell is much less acute, and scent is a major component of taste. The low humidity dries out our nasal passages, and the air pressure desensitises our taste buds. This means when food items are cooked at sea level and spiced accordingly will taste bland if eaten at height. That is why airlines opt for salty stews or spicy curries. Extensive researches have been conducted to understand the impact of high altitude flying on appetite. Flying at high altitudes is known to reduce appetite and hunger thus making palatable airline food a challenge for food service providers. The temporary changes in body chemistry also tend to alter the taste buds, requiring innovations in food science to confront this challenge. Spicer foods and blander beverages are well accepted.

Mostly now passengers accepting the fact that plane food normally tastes disappointing in taste. For food to taste the same before it is in the air, airline caterers have to add up to 30% more of sugar or salt to a meal. A lot of noise affects our smell and taste ability softly played music creates an environment favourable for elegant dining experience.

According to researchers, loud noise might interfere with an individual's ability to taste the flavour of food. It can suppress the perception of certain basic tastes. The perception of sweetness and saltiness reduced in loud noise. Our taste bud gives sensation of sweet, sour, bitter, salty, and umami. Odours come from air stimulates receptors in the nose; if the receptor affected there is no smell can be sensed. The senses of smell and taste are directly related because they both use the same types of receptors. If sense of smell is not functional, then the sense of taste is also not function.

4.2 PASSENGERS FOOD ACCEPTANCE :

Meals served on airplanes are not so delicious, especially for economy class passengers on international or long–distance flights. In domestic flights the situation is different as there are limited varieties and some passenger may get their food cold. Airplane food has a bad reputation in terms of food they are being served to them, the way the food itself is prepared and stored, the environment in which it is served on–board and the flight conditions all combine to affect the taste. Meals are prepared in advance, and are shelf–stable for hours. Reheating is done inside the plain where condition is not that much ideal, due to that the taste is not so great as it should be. The method of preparation is as similar as fast foods; the delivery is done in same manner. But the flight attendants serve a larger number of people in a smaller amount of time than in fast food establishments. Both Airlines and passengers understand the fact that in a very short duration 250–plus passengers are being served and as a result the food would either get cold or dry. It is also being observed passengers do not purchase food by cost but the fact value for money they understand and keep in mind. Food choice factors also vary according to life stage and the power of one factor will vary from one individual or group of people to the next.



Now, passenger also accepts the food airline companies serve up is bland or unappetising, it's not their fault. They also understand we lose our normal sense of taste while on board.

4.3 FOOD SENSORY ANALYSIS :

Food is a sensory stimulus. The physiochemical nature of food is determined by ingredient, processing & storage variables. When we come into exposure with food it interact with our senses to taste, appearance, texture, smell etc. this sensation is known as sensory evaluation.

According to AV Cardello, sensory model of food acceptance, there are four aspects of food the effects consumer behaviour towards certain foods are physical, sensory, perceptual, and hedonic. All foods have attributes of appearance (colour, presentation, etc.), and texture (soft/hard, crispiness, etc), flavour (taste and smell), and temperature, depending on their composition and preparation. These attributes dictate the impact on the above and hence the enjoyment or acceptability of food. In other words, the human senses (taste, smell, texture, and vision), singly or in combination, influence appetite and consumption of food.

Palatability of food can attracts and stimulate acceptance of passenger/ consumers. It is proportional to the pleasure the experiences while eating. It is dependent on the sensory properties of the food such as taste, smell, texture and appearance. Sweet and high–fat foods have an undeniable sensory appeal. We should also keep in mind that while it is not about nourishment but is often consumed for the pleasure value it imparts.

The influence of palatability on appetite and food intake in humans has been investigated in several studies. There is an increase in food intake as palatability increases, but the effect of palatability on appetite in the period following consumption is unclear. Increasing food variety can also increase food and energy intake and in the short term alter energy balance.

Appetite : Hypothalamus is regulator of appetite and thirst by producing hormones. The simplest model is of two centres in the hypothalamus, called the feeding and the satiety centres that regulate food intake. The 'feeding centre' is stimulated by hunger sensations from an empty stomach, while the 'satiety' centre is stimulated when the stomach is full. Psychological state of the individual also may affect the production of hormones.

Aroma : Food aroma forms a crucial sensory signal and a fundamental component of flavour perception and thus it shapes the way people experience taste and texture. The aroma acts as a signal of the presence of edible or inedible food even before the consumer sees the food. Therefore, various food establishments use attractive aromas of their products to entice and capture potential clients. Food aroma directs acceptability towards the food.Food acceptability is signalled by the odour of food, whether perceived or not.It directs the attention towards the food sources through the priming implicit memories and arouses anticipation of energy or nutrient associated with the consumption.

Taste : Taste refers to the proximal sense that requires direct contact of food with stimuli on the tongue to determine the quality of the ingested food. The effect of taste on food acceptability is strongly correlated with the personal preferences that people have.

Taste' is consistently reported as a major influence on food behaviour. In reality 'taste' is the sum of all sensory stimulation that is produced by the ingestion of a food. This includes not only taste per se but also smell, appearance and texture of food. These sensory aspects are thought to influence, in particular, spontaneous food choice.

Texture : Texture is multimodal–sensory food characteristic. It is the functional and sensory manifestation of surface, mechanical and structural properties of foods that are detected through sensory, vision, hearing and touch. This sensory attribute of food is conceptualised through various ways such as thickness, creaminess, crunchiness, firmness, and smoothness. Just like taste and aroma, the texture is an indicator of food quality and it strongly affects food acceptability. People seem to consume different food types based on their texture. Food texture also controls the belief about satiation effects of beverage or foods which ultimately influence food acceptance at a particular time period. Research indicates that foods that are thicker and chewier are believed by consumers to be more fulfilling.

Appearance : Consumers attracted to appearance and the way the food is presented. They first eat with their sense of sight. It is because we have our own expectations of how particular foods should look like. When the colour of food is different from what we expect, we believe the food will taste different. Passengers use visual cues to judge the quality of food they are meant to eat. Colour of food is the first element realised in the appearance of a food product. The process through which we accepts or rejects food is considered to be of a multi–dimensional nature. There are three critical factors that determine food acceptability. They include consumer characteristics, sensory characteristics, and enjoyment of food. Sensory characteristics of food such as taste, texture, aroma, and appearance have distinct and influential effects on food acceptability. Therefore, a sensory attribute of food is considered the key area in which food manufacturers can successfully use to differentiate their products. Consumer characteristics which affect food acceptability include knowledge, innovativeness, attitude, belief, and perception of particular food products. Lastly, the 'feel good' factor is also an essential determinant of food acceptability.

4.4 FOOD AND MOOD :

Eating and drinking is affected by mood and behaviour of an individual. Conversely, mood can influence eating and drinking patterns. There is a popular belief that if you are missing the breakfast you will be less alert and impair cognitive efficiency and after having heavy lunch it rises to 'post–lunch dip'. With good mood people likely to prefer balanced diets however, some people tend to consuming comfort foods, or overeating. Food preference, food choice and food habits are the factors related to food acceptance. Food preference is liking or disliking of a food by an individual, at a given time foods selected by an individual is food choice and food habits are the sum of the food choices of an individual, constituting total diet. With increase in awareness and knowledge of nutrition contain, food habit of individual may change. The acceptance or rejection of food entirely depends on mood or perception of consumer i.e expectations and needs. A passenger who is going to consume the food may have the tendency to compare the expectations they have on the sensory properties of food and the actual properties delivered by the product. Similarly eating a meal can alter the mood and emotional tendency, if food taste well it reduces arousal and irritability, with increasing calmness and positive affect whereas in case of disliking the taste it will affects adversely. While most passengers do not choose food on the basis of the expected effects on mood, the overall enjoyment of the flight can include the quality of sleep which can be influenced by the nature of the food provided.

4.5 ENVIRONMENT AND FOOD :

Weather, time of day, temperature, light, atmospheric pressure, altitude etc. are environmental factors that influence food choices. The physical presence of food also affects diet. Food service, food temperature, noise level and etc. also It is well known that the sense of taste and smell are affected by the cabin environment, may reduce the enjoyment level of meals. The low humidity of the cabin (approximately less than 25 per cent) dries the mucous membranes lining the nasal cavity and reduces the sense of smell. Similarly, dryness of mouth can affect the taste receptors. The inhibition of taste and smell has a consequent effect on the digestion process that is stimulated by these senses. It is worth noting that odorants and the general aromas in the cabin can also mask or distort the experienced flavour of foods provided. As the meal is perceived as being a valuable part of the overall service provided to the passenger, airlines have made considerable efforts to modify dishes so that they have stronger and more robust flavours to improve enjoyment, possibly without a full appreciation of all the influential factors affect consumer perceptions. The cabin environment also effect on taste and smell. In acute high–level stress, such as under a serious physical threat, the appetite is suppressed. However, less intense but more long–term stress, like work pressure, can affect eating behaviour in different ways. It is estimated that around 30% eat less than normal when stressed, while most individuals eat more.

4.6 EFFECTS OF SPECIFIC FOODS :

Some foods have nature of attracting appetite. Person always eat to satisfy his hunger need, sometimes we eat just because of appearance of that food. If we see a food first time the stimulants encourage to try the taste of that food. It has been observed a person tends to eat a food just because it is his favourite food. Think about your favourite food when it comes close to you, your desire to eat increased even your stomach is full or you have eaten few minute earlier.

❑ **Check Your Progress :**

1. The food flavour are :
   (a) Sweet (b) Salty
   (c) Umami (d) All of the above options
2. In–flight food served should be :
   (a) Hot (b) Balance in flavour
   (c) Both (a) and (b) options (d) None of the above options
3. The physiochemical nature of food is determined by ingredient, processing & _____ variables.
   (a) Storage (b) Taste
   (c) Production (d) None of the above option
4. Who has given sensory model of food acceptance ?
   (a) A V Cardello (b) J Jonson
   (c) Washington Hamilton (d) Adam Smith

5. Food taste same before it is in the air, airline caters have to add _____ more sugar or salt to meal.

   (a) 10% (b) 20% (c) 30% (d) 40%

6. Wine or alcohol is allowed in–flight catering :

   (a) Allowed (b) Not Allowed

   (c) Can't Say (d) None of the above options

7. _____ is the first element in the appearance of food product.

   (a) Taste (b) Smell

   (c) Colour (d) None of the above options

8. Flying high have the challenge for food service because of reducing _____ and hunger.

   (a) Smell (b) Taste

   (c) Appetite (d) All of the above options

4.7 LETS US SUM UP :

Sensory characteristics of food are considered the key area in which food manufacturers are using to provide differentiation in products that helps in enhancement in food acceptability. Airline catering must attempt to account for the influence of the cabin environment on the each component of the sensory model physical, sensory, perceptual, and hedonic, for example, balancing such factors as the ambience and the taste of food as well as the socio–cultural contexts.

Whatever we eat determine by Biological determinants : such as hunger, appetite, and taste, Economic determinants : such as cost, income, availability, Physical determinants : such as access, education, skills (e.g. cooking) and time, Social determinants : such as culture, family, peers and meal patterns, Psychological determinants : such as mood, stress and guilt, Attitudes, beliefs and knowledge about food are factors that directs our choice and acceptability.

So as to passenger's appetite and behaviour are affected. While flying sensory abilities such as smell, sight, and taste are affected. Taste buds may function as much as 30 per cent below par. The dry cabin atmosphere dehydrates mucous membranes in the nose, which blunts the sense of smell. The body movements minimize at high altitude and may require easily digestible meals. The cabin pressure may distort the ability to interpret food flavours, or colour. In the stomach, the pressure in an aircraft cabin also causes gases in the body to expand which may result in a bloated feeling. It would suggest light foods such as fish or salad rather than fatty foods. In compensating airlines often opt for salty stews or spicy curries for the unique conditions of flight eating; the choice is often for more highly seasoned food and the use of herbs to stimulate stronger taste for passengers. Wines lose its aroma and bouquet at such a high altitude, what they produce when consumed on the ground. Alcohol acts more quickly in pressurised cabin and also speeds dehydration leaving passengers both drunkard thirsty. Airlines continue to keep under review their policies in the in–flight ambience.

4.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. (a), 2. (c), 3. (a), 4. (a)

5. (c), 6. (a), 7. (c), 8. (a)

4.9 GLOSSARY :

Acceptance : liking for specific food item.

Appearance : The visual properties of a food product, including size, shape, and colour.

Appetite : Desire or inclination for anything, but more especially for food.

Aroma : food sensation via the throat – nose – duct.

Cognitive efficiency : the qualitative increases in knowledge gained in relation to the time and effort invested in knowledge acquisition.

Environmental factors : Aspects of a setting, atmosphere, or location that influence an individual's choices, such as layout, ambiance, marketing, and availability.

Hypothalamus : a small region of the brain, located near the pituitary gland which controlling appetite.

Post–lunch dip : is a universal phenomenon when a person feels to sleep in day time after lunch, whether eaten food or not.

Receptor : a protein on a cell wall that binds with specific molecules so that they can be absorbed into the cell in order to control certain functions

Umami : one of the five basic tastes, the savoury taste of foods such as seaweed, cured fish, aged cheeses and meats

4.10 ASSIGNMENT :

1. What are the different kinds of flavour and give 2–2 example each ?
2. Write a short note on food and mood.
3. What are components of food sensory analysis ?

4.11 ACTIVITIES :

1. Make a list of menu of different airlines usually served.
2. Interview 5 people (who have experience food in flight) about in–flight catering and record their experience. After recording their experience find out the areas of interest of these responded.

4.12 FURTHER READING :

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2. Stone, H., Bleibaum, R. M., & Thomas, H. Sensory Evaluation Practices. 4th edn (Academic Press : San Diego, 2012).
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BLOCK SUMMARY :

Once public transport become more popular and more people started using it for leisure travel, the service provider started realising the needs of passengers. The airline industry has evolved massively over the years, but one sometimes overlooked aspect of this evolution has been the development of in–flight catering. However, eating is one of the fundamental needs of human being. Transport companies started to offer food, beverages and much more than just a journey from one place to another. Initially On–board catering was the privilege of the wealthy social classes who were not just travelling to move one place to other but seeking enjoyment in it too.

With the increase in global competition, every sector of business and industrial growth requires and demands fast mode of transportation, so flights become preference. The trend of regular flights all over the world, passengers whether business or family prefer to have food in flight this saves there time. Whether it is lunch or dinner they look forward for some good food in the flight itself. This is a growing need and is encouraging various airlines in opting in–flight catering services to serve the customers at the best. If the food and beverages supplied turn up to be good enough and as per the expectations, that in no time the airline will earn customer loyalty of the expansion of the business.

Flight catering is considered as one of the most complex operational systems in the world. Presence of airports and flight production units at different locations is one aspect of this industry and they are found in every corner of the globe. That means the operation need to done in different climate and conditions, from very cold to very hot, from arid to very wet. In extreme and very cold conditions transportation from the production unit to the aircraft get affected. For instance, hi–lift trucks are inoperable during the winter if it is used in Sweden as they were not equipped to cope with very low temperatures. Similarly, it is required to wash trolleys and then dried centrifugally in order to remove all trace of water. Water left on the trolley wheels can freeze in the short period they are moved onto planes. Climate also affects the design and layout of loading bays. For wet climates, dock need to be designed in such way so that trolleys can be loaded onto trucks under cover and do not get wet. It is also need to prevent water or snow from blowing into the assembly area. In hot, arid regions prevention of entrance of sand and dust into trolleys wheels that can hinder while move. Provision of door closures that make ease to move along with trolley. Insect screen is required to prevent insects from enter into food or food contact surfaces.

The meal planning involve various considerations that affected by the time of flight, length of flight, point of embarkation and disembarkation, ethnicity or religious view of passengers, seat class (economy, business or first), budget allowed by the airline, price of food, seasonality of food, cost of labour, time requirement for serving, number of attendants required, consumption timing, convenient to eat, space requirement to serve and eat, clearance time and efforts required, customer demands, odours of food the cabin, re–heating or freezing

capacity. However the considerations may vary from flight to flight and airline to airline.

Sensory evaluation of food is a science that analyse, measures, and interprets the reactions of a person senses." It is a means of determining whether product differences are perceived, the basis for the differences, and whether one product is liked more than another. Or we can say Sensory evaluation is about the use of senses Vs simply eating a food to satisfy the hunger.

Humans are regularly exposed to pleasurable foods. Some people use food as a way to relieve stress and counter negative emotional states, whilst others do not. In people who strictly control their food intake (restrained eater or dieter). Stress can override their conscious control, leading to overeating of 'restricted foods'. There are also differences in people's ability to differentiate between hunger and other unpleasant internal states like stress. It is suggested that perhaps those who are more 'tuned in' to their appetite and metabolism are the ones who eat less in response to stress. Most of the accounts that one reads about in the pressure concerning the parlous state of airline food tend to point the finger at the reduced cabin air pressure and the lack of humidity. While both of these factors undoubtedly play an important role in helping to explain what is going on, they are by no means the whole story. Indeed, the latest research now suggests that the sounds of the engines likely also plays an important role here too, suppressing our ability to both taste and smell.

BLOCK ASSIGNMENT :

1. Why 3.5 sets of equipments require in–flight catering ?
2. What are the different kinds of flavour ? Based on these flavour make a list of Indian cuisine food item.
3. The history of airlines industry starts from the military use of aircraft. Comment on the statement.
4. Write a detailed note on in–flight catering.
5. Food is all about mood, whether preparing or having it. Justify with example.

FLIGHT CATERING

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ISBN 978-81-945630-8-2

Edition : 2020

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

FLIGHT CATERING

Contents

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BBAATR-106

Flight Catering

BLOCK 2 : FLIGHT CATERING SUPPLY CHAIN AND INVENTORY MANAGEMENT

FLIGHT CATERING SUPPLY CHAIN AND INVENTORY MANAGEMENT

Block Introduction :

The learner will develop understanding supply chain in flight catering process in this block. The supply chain is key component of flight catering. It starts from stacking of prepared meal in hot trolleys then picking up from base kitchen to placing in-front of passengers to consume it is prefect temperature. The learner will also get to know about various types of inventory, keeping records or valuation of stock and its security in this block. The learner will enjoy learning about organisation of kitchen, principles of flight food production, production of food planning, planning for staff and various equipments to produce food. The most important part will be learning about HACCP. The learner will get to about packaging of food items and purpose for this. The learners will be amaze to know the range of food serve in the flight in this block.

Block Objectives :

After understanding this block learns will have knowledge of :

- Supply chain of flight catering
- Role and responsibility of manufacturer, purchase specifications, receiving procedures and storage
- Types of inventory, stock valuation, stock control and issuing
- Kitchen layout, equipments for cooking
- Hygiene and sanitation (HACCP) at work place
- Convenient cooking, packaging of food, wastage control, food quality and safety

Block Structure :

Unit 1 : Basics of Flight Catering Supply Chain and Inventory

Unit 2 : Inventory Management

Unit 3 : Kitchen organisation & Management

Unit 4 : Meal production & Packing

UNIT 01 *Basics of Flight Catering Supply Chain and Inventory*

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- Understand the role of food and drink manufacturers
- Identify purchasing procedures and supplier relationships
- Understand role of purchase specifications
- Identify how goods are received and stored
- Understand the principles of inventory management

1.1 INTRODUCTION :

A supply chain involves a series of steps involved to get a product or service to the customer. The steps include moving and transforming raw materials into finished products, transporting those products, and distributing them to the end–user. The entities involved in the supply chain include producers, vendors, warehouses, transportation companies, distribution centres, and retailers.

The elements of a supply chain include all the functions that start with receiving an order to meeting the customer's request. These functions include product development, marketing, operations, distribution networks, finance, and customer service.

1.2 SUPPLY CHAIN :

A supply chain is complete system of producing and delivering a product or service, from the sourcing the raw materials to the delivery to the consumer. The supply chain includes all the aspects of the production process, activities to be performed at each stage, information need to be communicated, natural resources transformation into useful materials, human resources, and other components that go into the finished product or service.

A supply chain is a network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network includes different activities, people, entities, information, and resources. The supply chain also represents the steps it takes to get the product or service from its original state to the customer. Airline companies develop this network to reduce their costs and remain competitive in the business area. It enhances production cycle faster. Supply chain management is a very important part of the business process. There are many different links in this chain that require skill and expertise. When supply chain management is effective, it can lower a company's overall costs and boost profitability. If one link breaks down, it can affect the rest of the chain and can be costly.

❖ **Supply Management or Supply Chain Management :**

The term supply management refers to the act of identifying, acquiring, and managing resources and suppliers that are essential to the operations of an organization. Also known as procurement, supply management includes the purchase of physical goods, information, services, and any other necessary resources that enable a company to continue operating and growing.

It is a systematic business process that goes further than procurement to include the coordination of pre–production logistics and inventory management, along with budgeting, employees, and other key information to keep the business running smoothly.

In service industry, supply chain is meshwork chain structure, relying on information platform and logistics platform, combining suppliers, logistics processing and distribution centre, catering enterprises, customer, and providing the logistics service, information service, product service and customer service. Service–oriented catering supply chain has features like :

Customer satisfaction : it is utmost important factor for service industry. Today consumers not only concern about the price but also the taste, safety, quality and nutrition of food.

Quick frequency : The products are consumed of at a very fast rate; also the kinds of product are variety. The service–oriented catering supply chain should improve the ability in dealing with variable demand and production flexibility.

Logistics : fresh fruits and vegetables are to be transported have to be equipped with cold chain logistics equipment. So the logistics capability of catering industry service supply chain has higher requirements in comparison to other industry.

Stability : The price and the quality of raw materials are fluctuating. While the enterprise clients wish to avoid risks, they hope the price, quality, and variety of food has a stable situation.

Information : information is very crucial element of any management. Continuous improvement in information level helps in preventing bullwhip effect. Information detection methods can effectively monitor food in transportation in the process of storage quality.

❖ **Objectives of Supply Chain Management :**

The flow of manufacturing costs means the process of using raw materials and labour to finished product that can be delivered to a customer. A supply chain management system not only reduces the cost but also reduces complexity of the manufacturing process. Supply chain management aims to :

(a) The plan or strategy

(b) The source (of raw materials or services)

(c) Manufacturing (focused on productivity and efficiency)

(d) Delivery and logistics

(e) The return system (for defective or unwanted products)

(f) Minimize shortages and keep costs down

(g) Make recommendations to improve productivity, quality, and efficiency of operations

Vertical Integration : It is a strategy whereby a company owns or controls its suppliers, distributors or retail locations to control its value or supply chain. It is very beneficial for companies because it allows them to control process, reduce costs and improve efficiencies. However, it involves significant amounts of capital investment. Implementation of vertical integration strategy is both beneficial as well as some limitations.

1.3 STAKEHOLDERS :

A specific aspect of the flight–catering industry is that both airlines and caterers order from suppliers, but that all, or nearly all, products are delivered to the caterer's production facility. It is then the caterer's role to deliver products to the aircraft. The four major stakeholders in the in–flight service supply chain include :

1. The Passenger
2. The Airlines
3. The Caterers
4. The Suppliers
5. The Logistic Service Providers

The Passenger : passengers are actual consumer of products and services supplied by airlines. Consumer satisfaction is for most important concern for provider. The success of supply chain management is depending on satisfaction of consumer. How long the process is or how fair and honestly other stakeholders are doesn't have any significance if the consumer is not liking it or do not feel value for money. Passenger re–flying is major concern for any airline.

The Airlines : Airline is actual service provider for passenger. Passengers do not need to concern about who are caterer, supplier and logistics. They are paying to airlines, airline need to meet their expectations. If airlines fail to meet the expectation the brand image is affected. Airlines need to plan and designing of service and food delivery on time. The decisions regarding food and equipment served on–board can involve an enormous part of the overall supply chain cost. Customization is required time to time as per market demands and customer feedbacks on previous experience. This continuous customization of either small item, such as catering equipment, causes increased cost of supply by individual airline.

Since last few years the airlines increased their focus on procurement rationalisation, product standardisation and supply chain efficiencies as a key strategy driver. At the same time acquisitions and merged operations between major carries by Region have been also started.

The Caterers : Cooking of food and loading of food and equipment are the main roles of a Caterer in the in–flight supply chain. In perfect service–oriented catering, caterers need to ensure the quality of the food throughout the processing and delivery. Then through professional cold chain distribution, ensure food in low loss of logistics process, and also ensure food fresh and high quality. This is a good way to promote the enterprise competitiveness of catering enterprises. They need to Load the equipment and food on board, after it is assembled of trays and trolleys.

The caterer is may be in an unusual or at difficult position. They are the customer of the supplier, the products used are not of their choice but it has been determined by the airline. However, the caterer is most of the times responsible for keeping and accounting for all food and equipment served on–board and these products are usually delivered directly to the caterer's store.

Products belonging to one airline cannot be used for another, even if the two airlines are using identical products. Therefore caterers are compelled to expand their storage and logistic areas, to an extent where in some cases it represents up to 30% or more of the total space at the catering unit. A wide range of specifications that airline may ask or asking from caterer, is the most complexity and caterer has to handle it. Mostly there is less variances of recipes or equipment, still caterer is maintaining both physical and data flows individualised by airline. It also increases the complexity, space and labour requirement, which increases the chance of potential mistakes and extra costs.

Caterers have increased their focus on continuous process improvement and efficiency in last year. Now major caterers have started application of well–known continuous improvement methods, such as LEAN and Six Sigma.

The Suppliers : Suppliers supplies airline selected products to airlines as well as direct sales to caterer. For Airline selected, the airline defines and negotiates product specifications, price, etc. whereas in direct sales to the caterer, caterer buys the product based on airline specifications and mutual agreed terms. Manufacturer produces these specified items in volume at a lower cost and supplies it to caterer. The cost of labour to mass produce meals is economical for both. In past years it has been observed that both food and equipment suppliers have begun to eliminate some elements of the supply chain so that they can supply airlines from wherever their factories are located, minimising cost related to space and labour (in terms of food) double–handling and carrying extra equipment.

From the whole services supply chain, raw material purchasing and the choice of supplier is the first thing throughout the supply chain activities. It is very important. Because the quality of raw material will directly affect the quality of the finished products, thus affecting customer satisfaction; And the price of raw materials is also constitute an important part of the final product price of restaurants, the competition ability of the enterprise will also get an impact. So do raw material purchase and supplier management well is a good beginning for the service–oriented catering supply chain, is also a good way to improve the competitiveness of catering enterprises.

The Logistic Service Providers : The logistic service provider in the in–flight supply chain is normally a global logistics company. These companies have specialisation in moving goods across the globe in containers. The use of global logistics service providers enables both caterer as well as airline to manage the flow of materials from aircraft to flight kitchen and back again in more sophisticated ways. They have begun to setup specialised teams to help airlines with their need for increased supply chain efficiency.

Logistics is also concerned with adding value and reducing waste across the supply chain. Particularly non–consumable or non–disposable stock items (such as crockery, glasses etc.) as these items are cost intensive therefore, the airline´s capital is engaged in it. To use equipment stocks effectively and efficiently, logistics focussed on **:**

- Planning and forecasting of demand and supply
- Purchase contracts
- Inbound and outbound Transportation
- Warehousing
- Inventory management
- Stock balancing across the network
- Galley and trolley planning

As the airline business have competitive environment, most airlines started to give efforts on continuous improvement by achieving cost efficiencies across their in–flight supply chains. Over the past years we have seen the airline´s supply chain increasing involvement in the airlines strategy design and execution process. Reduction of storage space and acceleration of Customs clearance process is some of the example of airline concern towards this.

1.4 ROLE AND RESPONSIBILITY OF MANUFACTURER :

Manufacturing and production are primary focuses for airlines. The step involves packaging, product staging, releasing and production activities. Recipe designing, meal preparation, food testing, food processing, hospitality services production networks, equipment and facilities, and transportation are integral part of this system. Integration is also important for the smooth operation of supply chain, and the airlines, caterer and supplier have to ensure and participants work together to fulfil common goals. For surviving in business, manufacturers continuously seek to develop and expand their business. For this manufacturer is focus on establishment of additional outlets to extend customer base and retain the existing customers while at the same time extend the market share of their products offered. Food and drink manufacturers are trying to develop new product lines or modify and improve existing product ranges. They offer the new or

revised products to the flight caterer and airline. It is potentially risky, as the airline or caterer may reject the product; at the same time it is also be very expensive.

Manufacturers have to develop, sell to and keep satisfied two distinct customers–the caterer and the airline–both of whom may have competing or differing interests. In order to achieve this careful balance, many manufacturers need to go to considerable lengths to provide products that satisfy both customers. They might need to develop and offer products which are either unique or perhaps have been branded to provide a degree of product differentiation.

While seeking for new product development, manufacturers need to go out of box rather than other commercial catering outlets. The capability of product to withstand during processing, chilling, transportation, and being held for some time before being reheated and consumed, is also an important factor. The product, have to be suitable for the particular process and conditions that it is likely to be subjected to. Commodities that are difficult to transport or that are not able to withstand or adversely affected by changes in pressure can be unsuitable for flight provision. All packaged items (food and drink) should have specified dimensions so that it can fit into space consideration aspect.

1.5 PURCHASE SPECIFICATIONS FOR IN–FLIGHT GOODS :

Flight consumables and non–consumables goods are normally purchased in bulk. The volumes of food and drinks purchases in the international airline are more considerable. The purchasing process is an essential part of every food service operation. It aimed to buy appropriate items (food, beverage and amenities), in accurate amounts, at the right time, and at the best price. It ensures freshness of food and inventory turnover. Foods served on–board, is highly perishable (meat, vegetables, bread and so on) and deteriorate in time, some more quickly than others. So during purchasing of any good it is necessary to ensure the quantities, qualities and so on as well as availability and immediate supply if required in future, with same specification.

In general term the complete description of the purchasing goods is called purchase specification as it specifies in detail about what is to be purchase (brand, quality, quantity, dimensions etc.). It provides the clear guidelines to both purchasing personnel as well as vendors with criteria of minimum product or service acceptability of the buyer's requirements. The specification is the total description of the purchase.

Purchasing and sourcing of flight consumables and non–consumables may differ from conventional catering operations need to be considered. For instance some passenger prefers to eat their own cuisine and expect to see indigenous foods on those flights. Or some passengers fly a national carrier partly because they like or prefer that style of food. In both cases flight has to be ready with these options. To attract customer, product differentiation can be a good strategy. These sensitive aspects in flights the must be considered in relation to the flight destination. Airline takes cognisance of the dominant political, religious and cultural influences of the region in which flights occur.

Specifications may include brand names, product size, type of packaging, container size, fat content, count per kilogram, special trimming, and so on. The specifications should be specific, realistic, and easy to verify.

The main advantages of specifications are : Reduce purchasing costs as higher quality products need not be accepted, Ensure constant quality in menu items and, Allow for accurate competitive bidding among suppliers and so reduce costs. Specifications do not include general delivery procedures or purchase price. As directions and prices can change quickly and are depend on various other unavoidable circumstances. Accuracy, consistency, on–time delivery are main concern for any specification any purchase manager focused on.

1.6 ORDERING OF FLIGHT GOODS :

Foods, drinks and other amenities are provided by various suppliers. For example, if we need to purchase dry items from wholesaler whereas meat and meat products can be obtain from either local butchers or have to purchase from packing house. Purchasers have to check with different suppliers for different products. Organisations have to establish contact with available wholesalers, local producers and packers, retailers, cooperative associations, and food importers. Some wholesalers diversify their product lines in order to meet all food–related kitchen needs; they also have to be taken into consideration. All the transactions have to be recorded and documented in such a way that it can readily available during receiving, payments, budgeting or other operational purposes.

Ordering Perishables and Non–perishables items : Fresh items such as fruits, vegetables, fish, meats, poultry, and dairy products etc. have lesser shelf life (they degrade and spoil quickly). Perishables are to be ordered frequently to ensure freshness. Frozen foods, such as vegetables, fish and meat products, have a longer lifespan and can be ordered less frequently and stored in a freezer. Non–perishable items include dry goods, flour, cereals, and miscellaneous items such as olives, pickles, and other condiments. These can be ordered on a weekly or monthly basis.

1.7 RECEIVING OF IN–FLIGHT GOODS :

Once order for goods has been placed according to its specification, it is to ensure to receive products as per specification given during order. Although there is the rare chance of receiving supplies that are not up to the mark, or poor in quality, or more or less in number, but the person who is receiving have to ensure by cross checking the product with original order. Any discrepancy in number must be recorded but in case of quality and some other crucial mismatch he is liable to reject the delivery. Goods receiving' is the function of checking items that is delivered. It includes inspecting the quality, condition, and quantity of any incoming goods, and allocating them to a space in the warehouse.

Delivery includes management of orders, warehouse, and transportation. It also takes account of receiving orders from clients, along with invoicing as soon as any product is received. It includes management of inventories, assets, transportation, product life cycles, importing, and exporting. In–flight catering, receiving includes, catering services, food distribution, administrative services and waste disposal management. Organisation has a separate delivery entry to unload goods from delivery vehicles. Cargo bays have high–level platform so that items from the vehicles can be done easily. Near bay there is an area for temporary storage, checking and unpacking of delivered items. After receiving items are allocated to concerned store or to the production area directly.

During receiving it is to assured that :

- Delivered supplies must be checked for hygienic delivery and condition.
- Deliveries to be checked against the purchase order and mentioned in receiving logs
- Discrepancies regarding hygiene conditions, temperatures, quality, weight, and grades must be noted and resolve it with vendor immediately.
- Vendor shipping documents must be corrected to show any discrepancy in quantity
- Potentially hazardous food must be sent refrigeration immediately
- Records must be maintained with date and time of receipt, at the same time other information such as batch numbers, lot numbers, production dates or use–by dates etc.


In-Flight Catering Checklist

Redefining In-flight Catering

Operator

Company Name

Person Ordering Catering Name (PIC)

PIC Phone Number / Email

Preference on Contact Method - Phone or Email

Billing Method - Direct / Credit Card / Fuel Bill

Tail / Trip Number

Aircraft Type

Heating Equipment - Microwave / Oven / Both / None

Flight Attendant - Yes or No

Storage Capacity

Request Confirmation

Logistics

Date - Month / Day / Year

Day of Week

Time of Delivery - Local Time

FBO/Hangar - Delivery Location

ICAO

Early Open Required - Yes or No

Passenger Requirements

Allergies / Food Intolerances

Preferences

Religious Restrictions / Requirements

Children Ages, If Applicable

Trip Detail

Length of Flight

Destination of Flight

Time of Departure

PAX Count / Crew Count

Catering

WOA - Meet on Arrival - Yes or No

International Touch

Decathering / Upload Required - Yes or No

Ware Washing

Course Type (Breakfast, Lunch, Dinner, Snack)

Bulk vs. Preplated

Concierge Items - (Newspaper, DVDs, Etc.)

Restaurant Fax Number

Alcohol

Premium Quantity

Crew Catering

Post Order Processing

Order Confirmation Received and Reviewed

Special Arrangements / Logistics Confirmed

Customer Follow Up

Crew Feedback

PAX Feedback

Operations Feedback

Comments Reviewed with Caterer

1.8 PROCEDURES FOR DELIVERING GOODS :

Once the delivery come the receiving, inspecting and acceptance are the basic steps that follows each steps has some sub–steps that are to follow by most of airlines.

1.8.1 Receiving the Good to be Delivered

It is the acts of taking possession of products for inspection, accounted as inventory, or deploy them to end user for immediate use. During receiving of delivery following sub steps are followed :

1. **Signing for Deliveries : t**he authorised person who is receiving need to sign the receiving documents provided by the supplier or shipping company to insure goods are being delivered. Inspection of item to be done before signing the receipt and initial the packing list. This packing list is submitted to the concern authority (Accounts Payable, Requester, and Asset Management) for financial reconciliation.
2. **Refusing Delivery :** Refusal of delivery is done only if they are unable to confirm that the order was placed by their department, or if the packing appears sufficiently damaged to warrant concern.
3. **Record keeping :** packing list for all shipments delivered to the department is very important. It is kept for record and reference. In case of non–recipient of packing list, the department can ask for copies it.

1.8.2 Inspecting the Good to be Delivered

In this step the product is being examined that have been delivered to determine conformance to the purchase specifications.

1. **Inspecting a Shipment :** Before receiving of shipments and acknowledging receipt an inspection is required to verify the following minimum requirements :
   - The products conform to the purchase order requirements and other relevant documents
   - The quantity ordered and the quantity delivered
   - Check for damage or breakage
   - Packing list, certifications, etc.
   - Products are operable or functional
2. **Substitutions and Over–Shipments :** it is not expected as well accepted to the suppliers to substitute products or deliver more than the amount ordered without concern of purchasing department. In case of Purchasing Agent, they have to notify the department as soon it occurs.
3. **Partial Deliveries :** Whenever a purchase is received as a partial delivery without acknowledgement or notification from the supplier the receiving authority contact the purchasing Agent and asks for clarification and the information is noted on the packing list.
4. **Failed Inspections :** In case of failed inspection it has to notify in writing and same result is forwarded to concern supplier and ask for appropriate action. When receiving items from freight companies, the number of packages received should match exactly the number on the freight bill. Inspection of all packages for damage to the outside container is necessary. Any visual damage also is noted on the freight bill before signing.

1.8.3 Acceptance of the Good to be Delivered

Next step is acknowledgment of the products delivered to conform with the purchase order so that the supplier may be paid. Shipments are accepted only

if the buyer acknowledges receipt to accounts payable and do not have a quality or delivery issue.

1. **Determining Acceptance :** Whenever any shipment or a particular item from delivery is rejected due to over–shipments, defective or for any other non–conformance. It is to be notified to the supplier and/or Purchasing Agent in a timely manner will mean the shipment will be considered "accepted".
2. **Securing Rejected Products in a Secure Area :** These rejected items are to be stored safely in a secured area until the products are either shipped back to the supplier, or the supplier takes possession of the products and removes them from the premises.
3. **Tagging Fixed Assets :** now it is responsibility of department to ensure tagging of each item accepted as per organisation policy. Tagging enable smooth issuing as well as provide ease in inventory.
4. **Refund of Product Returns :** Whenever shipment is done supplier is entitled to receive the payment as per PO.

Paperwork or documentation is very important in receiving and storing part of in–flight catering supply chain. In some cases, goods are delivered with an invoice which contains both lists of goods along with its prices or we can say it can be act as checklist as well as the bill. However, unpriced list is more common in the industry where the order is supplied along with a delivery note. In this case, the invoice is separately issued either on a weekly or monthly basis; it covers more than one delivery. The stores person signs a copy as receiving of the goods by ensuring purchase specifications.

1.9 STORAGE OF THE GOODS :

All supplies must be stored and used with the first in, first out system. After receiving of goods once the goods have been received and the paperwork has been done; now it is essential to transfer the goods to appropriate storage as soon as possible. As the goods are purchase in bulk the natures of goods are varying to perishable, semi–perishable as well as non–perishables, it has to be separate provision of storing. For instance perishables and semi–perishables need to send immediately to cold storage, refrigeration units or walk–ins. Depending on the size of operation, trolleys, carts, conveyor belts, or fork–lift trucks may be used for transportation to the storage areas. Quick and secure transportation ensures the goods, especially chilled or frozen products, do not deteriorate its quality and loose consumability. The tagging of food is essential, that includes manufacturing date, use by date by doing this ensure stock rotation and spoilage can be ignored.

Some foods come with excess packaging that is suitable for transportation but doesn't have any significance for storage need to be removed while storing it, it engaged the space in storing areas so fruit and vegetables are decanted from crates and boxes, and placed in plastic containers. Glass containers are emptied or replaced with plastic containers before storing in the unit to prevent breakage during the cooking process. Storage areas are designed i such a way that it is cool and well ventilated, free from insects, and equipped with easy to clean shelves and bins. Non–consumables are stored under normal conditions.

Spoilage can be prevented by application of safety principles such as :

1. Keep perishables and semi perishables in refrigerators or freezers as per perishability of item.
2. Store areas are to be kept clean hygienic
3. Follow principles of Hazard Analysis Critical Control Point (HACCP)
4. Proper Stock rotation is very important so the older items should be used first.
5. Provision for separation storage of flesh and other item that either creates or absorbed odour.

To overcome with theft or misuse

1. Provision and system for denial in unauthorised access. It can also prevent from cross–contamination.
2. Control system is also an important tool for issue and usages of goods received.
3. Scheduled inventory system is again a good tool to avoid misuse of goods inside the organisation.
4. Both physical and perpetual inventory system should be uses.

1.10 INVENTORY MANAGEMENT :

One of the greatest challenges for flight caterer is flight catering supply chain and inventory management. After goods have been delivered to the flight kitchen they need to be stored safely and securely. At the same time its records need to be kept. Inventory management is a critical aspect of the aviation industries. It is an approach for keeping track of the flow of goods in an organisation. It starts with procurement, warehousing and continues to the outflow of the raw material or stock to reach the manufacturing units or to the market. This process can be carried either manually or by using an automated or combination of both systems.

In–flight catering has too many supplies that can lead to too many inventory items. If they have little inventoried it can lead to delays and can result in expedited shipping that involves a lot of money. The reasons behind these excess items are **:**

- Due to menu cycles ingredients and products are changing regularly
- Caterers have association with different airlines so product specification can be different
- For consistency of products airlines have to be rigid with product specifications and similar items

- Meeting with product specifications is an integral part of the airline–caterer contract; so, stock–outs may lead to penalty payments or even loss of the contract
- Airlines purchase some items directly from the manufacturer and pay the caterer to store them in the flight production unit; so, stock has to be held separately to enable stock checks

In–flight catering industry is more concerned about stock–outs, cash flow, storage costs, and administration costs the best solution for this could be inventory management. Now both the airlines and caterer tends towards just–in–time principle (JIT), by this inventory management become more comfortable. In JIT, as far as possible suppliers are asked to supply materials as and when it is required by the operation. It is well said that "JIT is a 'pull system' based on the logic that nothing will be produced until it is needed". Most of the caterers use this technique partially or completely. This principle says that **:**

- Maintain optimum level only
- Don't stock unnecessarily
- Eliminate waste and unnecessary activities
- Focus on Quality at the source
- Clarify process flows
- Develop a relevant supplier network

❑ **Check Your Progress :**

1. Who among these is not a stakeholder of the in–flight service supply chain?
   (a) Passengers (b) Airlines
   (c) Caterers (d) All of the above options
2. Unloading is done _____.
   (a) Manually
   (b) With equipment
   (c) Manually as well as with equipment
   (d) None of the above
3. Purpose of material handling/management is _____.
   (a) To save time (b) Reduce wastage
   (c) Safety of goods (d) All of the above options
4. Material handling equipment includes _____.
   (a) Pallets (b) Moving trucks
   (c) Both (a) and (b) options (d) None of the above options
5. Material handling services are required to be performed during retailing processes, such as _____.
   (a) Lifting, holding, dropping (b) Loading and unloading
   (c) Positioning (d) (a), (b) and (c) option
6. Storage is _____.
   (a) Retaining goods (b) Production of goods
   (c) Transport (d) None of the above options

7. Caterers have started applying continuous improvement methods, such as _____ and _____ in physical distribution

   (a) LEAN (b) Six Sigma

   (c) Both (a) and (b) options (d) None of the above option

8. JIT acronomy stands for _____.

   (a) Just in Time (b) Judgement in Time

   (c) Jugad in Time (d) None of the above option

9. Once the delivery come the receiving, _____ and acceptance are the basic steps.

   (a) Storage (b) Inspecting

   (c) Both (a) and (b) options (d) None of the above options

1.11 LET US SUM UP :

A perfect service–oriented catering supply chain have professional standardization processing equipment, that ensure the quality of the food during the processing, or a professional outsourcing processing company to complete the processing tasks. Then through professional cold chain distribution, ensure food in low loss of logistics process, and also ensure food fresh and high quality. This is a good way to promote the enterprise competitiveness of catering enterprises.

A good service–oriented supply chain can quickly respond to the different needs of customers, in the shortest possible time to provide customer the most satisfactory service, can greatly enhance the enterprise the competitive ability. At the same time, the good service supply chain can quickly understand customer needs, it is a great help in development of new products, also it is a great help to quickly capture emerging market.

Due to continuous increase in the number of passenger, aircraft movement and the need for ever growing public demand for better services, airport industries need to continually strive to achieve operational success better than anyone else. The process from cooking to loading in–flight meals onto the aircraft involves many steps, performed by different sections of catering unit. The airline catering sector handles items, which are capital–intensive. The items also involve a huge number of components. A lot of these components are moving, creating challenges to track the inventory accurately. Items include both perishable and non–perishables. To reduce wastage, rotating stock technique is used. These issues make supply chain management all the more challenging for the industry.

Supply chain in airlines industry is essential to save costs of operations and supplies. The success of the business depends on the fact of how well a company adopts supply chain strategies. In view of low yields, cost–cutting strategies are mounting pressure on the supply chain. Outsourcing is one of the major reasons which have reduced the profit margins. The aviation industry needs to be aware of approaching shifts in the market. They quickly need to adapt these changes to deliver high customer expectations and position themselves to take advantage of these shifts. Deep competitor research, knowledge of new technologies and customer behaviour enable businesses to connect to customers and suppliers. Businesses can build trust and loyalty from trading partners and customers by being attentive to their needs.

A specific aspect of the flight–catering industry is that both airlines and caterers order from suppliers, but that all, or nearly all, products are delivered to the caterer's production facility. It is then the caterer's role to deliver products to the aircraft. So a flight production unit will hold its stock in stores, as well as stock owned by the airlines for which it has a contract. In many cases, airlines purchase their alcoholic beverage products directly from suppliers or distributors which are then delivered to bonded stores in flight production units. But airlines may also directly purchase other items for use or consumption on aircraft, such as soft drinks, paper products like napkins, and so on. Increasingly, supply chain management is linked closely to inventory management, as operations try to reduce their stock–holdings and rely on just–in–time (JIT) delivery. This has cash flow benefits for the business and also potentially reduces the capital investment costs in storage facilities.

1.12 ANSWERS FOR CHECK YOUR PROGRESS :

1. (d),	2. (c),	3. (d),	4. (c),	5. (d)
6. (a),	7. (c),	8. (a),	9. (b)	

1.13 GLOSSARY :

Bullwhip effect : refers to increasing swings in inventory in response to shifts in consumer demand.

Capacity management refers to the act of ensuring a business maximizes its potential activities and production output–at all times, under all conditions. The capacity of a business measures how much companies can achieve, produce, or sell within a given time period.

Cargo bays : section on aircraft or warehouse used for receiving and carrying cargo, equipment or any delivered goods.

Forecasting : The process of making predictions of the future based on past and present data and most commonly by analysis of trends.

Forklift : a powered industrial truck used to lift and move materials over short distances.

HACCP : Hazard Analysis Critical Control Points is an internationally recognized method of identifying and managing food safety related risk

LEAN : a system for developing process improvement that is continuous and has a focus on reducing and eliminating waste.

Perpetual inventory System : method of accounting for inventory that records the sale or purchase of inventory immediately through the use of computerised point–of–sale systems and enterprise asset management software.

Purchase order : or PO, is an official document issued by a buyer committing to pay the seller for the sale of specific products or services to be delivered in the future.

Shelf Life : The maximum time a commodity may be stored without becoming unfit for use, consumption, or sale.

Six–Sigma : To eliminate defects in a product, process or service, a disciplined, statistical–based, data–driven approach and continuous improvement methodology

1.14 ASSIGNMENT :

1. How does a store operations assistant deal with damaged goods ?
2. Explain the process of receiving goods.
3. What do you mean by pallets ?
4. Using personal protective equipment while handling goods is a must. Why?
5. What pointers should the retailer keep in mind while handling and storing hazardous or dangerous products ?

1.15 ACTIVITIES :

1. Demonstrate the goods receiving procedure adopted by the storage department of the store and also a grocery shop.
2. Demonstrate the goods dispatching procedure from the store floor where selling is going on.

1.16 CASE STUDY :

❖ **Emirates Flight Catering Case Study : Eight Priorities, Three Awards**

As the world's largest airlines–food provider, Emirates Flight Catering (EKFC) may have been supporting growth at parent Emirates Group since 2003, but its procurement department was then still focused on transactional purchasing.

The company provides catering and support services for over 130 airlines operating out of Dubai International Airport, employing more than 11,000 staff and serving an average of 200,000 meals a day. Yet, back in 2015 it was faced with slowing growth and rising costs. It needed to get greater value from its AED1.3 billion annual spend.

To achieve this, procurement had to move from 'post boxing' requests and rubberstamping purchase orders to a strategic, value–adding function – that meant a total transformation, from top to bottom.

Eight core priorities were identified, covering everything from increasing sourcing transparency to building the right talent and culture. These priorities were translated into a simple procurement compass model with four points : people – recruiting and training a team with a shared vision; governance – covering policies, culture and performance reporting; positioning – ensuring the department is recognised as providing knowledge leaders in sourcing solutions; and technology – for efficient and effective delivery. This meant project could be planned and executed in a structured way. It also gave the team with a point of continuity for the change, with consistent messaging and language.

EKFC examined every element to see where it could help deliver and embed the change programme within 24–months. In the first year the focus was on getting close to the business, while in 2017 it was about tackling non–contracted spend and control on pending requisitions.

It introduced an open–plan environment to encourage collaborative working and ran lunch–and–learn sessions with stakeholders to provide better understanding of the department's mission.

The transformation earned the team the CIPS 2018 Middle East award for Most Improved Operation – Step Change, and the overall award. The team has delivered AED85 million in hard savings, providing greater profitability and supporting the development of new facilities.

The judges were impressed by the speed of the transformation, which Kieran Dowd, vice president – procurement, says was made possible by a compelling case for change that was supported from the very top, and an energetic team with clear goals.

❖ **A Better Process :**

- The EKFC procurement team won a second category award : Best Process Improvement.
- The new leadership team set out to find a technology partner (Coupa) to deliver a purchase–to–pay system that would speed up transactions, improve spend visibility, pay suppliers on time and generate savings through better contract compliance. Innovation and the ability to regularly enhance the system was a key part of the tender.
- The team involved stakeholders in workshops to plan and design the system, and delivered a communication programme that created a buzz around the project to engage end–users.
- It took 13 weeks to set up the system, and after six months, requisition to order time had improved from 35.1 days to 4.1.

1.17 FURTHER READING :

1. Air Cargo Management : Air Freight and the Global Supply Chain by Michael Sales
2. Supply Chain Logistics Management by Donald Bowersox
3. Anupindi, Ravi, et al. Managing Business Process Flows : Principles of Operations Management. 2nd ed. Upper Saddle River, NJ : Pearson Prentice Hall, 2004.
4. Cox, James F., III, and John H. Blackstone, Jr. APICS Dictionary. 9th ed. Falls Church VA : American Production and Inventory Control Society, 1998.

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UNIT 02

Inventory Management

UNIT STRUCTURE

2.0 LEARNING OBJECTIVE :

After understanding this chapter learner will have knowledge of :

- Concept of Inventory Management
- Different types of Inventory
- Stock valuation, its control and
- Methods of issuing stock

2.1 INTRODUCTION :

In competitive market, organisations keep larger amount of raw material, purchased goods so that they can meet demand and keep the operations smoothly. In a volatile environment where demand is dynamic (rises and falls quickly), buffer stock become essential against unexpected changes in demand. These stocks also help in the situation when supplier is unable to deliver at the time of requirement or any other situation when material required is unavailable for operation. It can be said unnecessary purchase or stocking but it serve many purposes like quantity discounts for bulk purchase as well as time saving in purchasing as well receiving activities. Actually Inventory is an asset for organisation, and it is recorded as asset itself in balance sheet. In some industries, inventory management is also known as stock management because inventory is considered "stock on hand." As we know management and control, inventory management and inventory control differ with each other. Inventory control is managing a inventory, or stock, from the time it lands in the warehouse to the time it leaves. Good inventory control balances the cost of holding inventory against the risk of stock–outs, with an overall goal of maximising efficiency.

2.2 DEFINITION AND CONCEPT OF INVENTORY MANAGEMENT :

Inventory management is an approach for keeping track of the flow of goods in an organisation. In another word Inventory management is a systematic approach to sourcing, storing, and selling inventory–both raw materials and finished goods. In business terms, inventory management means the right stock, at the right levels, in the right place, at the right time, and at the right cost as well as price.

Inventory management is much broader than control it takes supply chain, manufacturing, fulfilment, sales and reporting into account. Organisations have to get an inventory management system in place before they drill down to control. Otherwise, organisation may lose the ways of managing suppliers, production or sales itself. Proper system enables countless methods for storing and selling products better.

Inventory management also directs inflow and ability to outflow the materials. It also shows the health of business, as well as supply to customers and sales status. It is crucial for manufacturer and distributors to manage inventory efficiently to meet market demand and survival. Inventory management can be improved by taking few steps :

1. Focus on in–flight passenger needs
2. Engagement with suppliers
3. Utilise real–time data
4. Utilisation of technological development
5. Develop an inventory management system
6. Best use of Inventory management techniques

Focus on in–flight passenger needs : Each item of inventory has not same demand some items are frequently asked and some are less frequent. Identifying or demand analysis is very important so that warehousing of high demanding and low demanding items can be stored in required quantity and curve–out the chance

of overstocking. Suppose you find that particular food is less preferred by your flying passenger, you shouldn't purchase that item in more quantity and at the same time you can know about what common items are being asked by them, you can stock it.

Engagement with suppliers : Managing supplier relationships is crucial for organisations that have stock–based business. Developing constructive relationships with suppliers is important to secure reliable supply, unlock competitive pricing and to understand emerging trends that may impact customer preference. For instance in–airline catering if your supplier observed that particular beverage is high on demand and informed you regarding same evenly you will think about change the beverage you are serving to your customers.

Utilise real–time data : Information is very powerful tool for any management system, but only when it's accurate, relevant and up to date. Real–time data is data that is up–to–date and viewable the moment it's available.

The use of data analytics to enable airlines to make more relevant guesses about which products will or won't sell on board is becoming big business. By analysing and providing detailed information on what people like or dislike or what's trending and what isn't in a particular region, software companies are helping airlines to increase their ancillary revenues and reduce waste.

Real–time data and analytics from layered inventory tracking right through to forecasting data, automatic ordering and individualised safety stock can make a real difference to your business. For the most accurate data, consider using perpetual inventory management software, as it is the best way to ensure the information you need is always in your control.

Utilisation of technological development : Airlines caterers use technology and its advancement to cut costs and satisfy needs of the flying passengers. Airlines focus to get as perfect as they can so as to caterer need to. To match passenger needs caterer need to have required technology that is handy too. Software in handy gadgets such as Mobile can revolutionise inventory management. As it is not only easy to carry but operating during flight too, they can place passenger orders or any requirements. While ordering it also reflects on inventory and the store–keeper become aware about the item availability.

Develop an inventory management system : Every catering organisation has to equip with any Property Management System (PMS). Management of order quantities, replenishment cycle times, safety stock, forecasts, seasonality and more is important. Inventory management system enables about actual ability of an organisation meet the demand and supply balance. Individual caterer has its own unique needs and circumstances, so they have to pick a system as per their requirement.

Best use of Inventory management techniques : Inventory management techniques are methods of keeping the right items in stock. Basically these are techniques that help in making strategy for storing, tracking, delivering, and ordering inventory or stock. There are so many techniques for this few of them are :

- **Just–in–time (JIT) inventory :** This technique is zero inventory system or manufacturing goods to order. In this means holding little stock as much as possible and nullify costs and risks in stocking.

- **ABC inventory analysis :** In this technique by identifying the inventory classifying them into different tiers or groups as per importance of demand and profit generation by it.
- **Drop shipping :** It is a demand fulfilment method where the products are essentially not stored instead; supplier purchases the item from a third party and shipped directly to the customer. However for airlines as well as caterer, it is difficult but airline supplier can use this technique.
- **Cross–docking :** In this system products are delivered to a warehouse where they are sorted and prepared for shipment immediately. They are usually reloaded into other trucks at the same warehouse and sent out for delivery immediately
- **Cycle counting :** in this inventory for particular items on a specific day without doing an entire stock take. This method helps in regular validation of inventory.
- **Economic order quantity (EOQ) :** optimal quantity of item needed to be ordered so that right amount of inventory in hand can be achieved. Total holding and ordering costs can be reduced with the help of EOQ. It is also known as the optimum lot size.
- **Days inventory outstanding (DIO) :** also known as Days Sales of Inventory, It is used to measure the average number of days inventory is being hold before selling it.
- **Safety stock :** is small, surplus amount of inventory keep on hand for emergency situations. Basically it is a buffer critical stock that is held to protect against unexpected supply or demand pressures.

2.3 TYPES OF INVENTORY :

Inventory may be Raw Materials, Unfinished Products, In–Transit Inventory and, Cycle Inventory. However it's depending on type of service/good providing nature of organisation. In airline catering organisations service as well as product is provided, hence they have to well equip with various small items also.

2.3.1 Raw Materials :

Raw materials are inventory items that are converted into components, subassemblies, or finished products. These items may be commodities or extracted materials that the organisation or its subsidiary is produced or extracted. It also includes the purchased items from outside for providing to the flying passengers.

Raw materials in–flight catering could be fish, chicken, meat, fruits, vegetables, ready to cook foods, cereals , pulses, tetra packed products, paper napkins and face towels, sauce, tanned products, and so on are kept under raw material inventory.

2.3.2 Work–in–process :

These items are also known as semi–finished goods. After getting the raw materials in–house, manufacturer started to make the finished products. Thus, the inventory is turning into finished products now it is called work in process inventory.

As per the Merriam–Webster dictionary, "Work–in–process (WIP) refers to a component of a company's inventory that is partially completed. The value

of that partially completed inventory is sometimes also called goods in process on the balance sheet (particularly if the company is manufacturing tangible items rather than providing services)."

2.3.3 Finished Goods :

It is completed part that is ready for a customer order. Therefore, finished goods inventory is the stock of completed products and passed final inspection requirements. It is transferred from out of work–in–process to finished goods inventory. Depends on nature of organisation, finished goods can be sold directly to their final user, sold to retailers, sold to wholesalers, sent to distribution centres, or held in anticipation of a customer order. In–flight catering it is supply to caterer who is responsible for loading on–board. In another word we can say finished goods inventory is the total stock available for customers to purchase that is ready for passenger supply. Now it will become raw material for caterer till they not loaded it on flight.

2.2.4 Transit Inventory :

When purchased items are transported from one location to another it may involve some time to get from one location to another. When goods or supplies are shipped from the supplier but not yet delivered to the buyer it comes under transit inventory. It depends on shipping terms between both parties about the possession and the freight charges.

2.2.5 Cycle Inventory :

Items in the store that required or used frequently through the supply chain is called cycle inventory. Generally these are products that arrive from supplier and immediately pushed out to customers. The inventory needs speed so the operations need to have quick and flexible procedures to keep up with the speed of cycle movements. It is an essential part of the inventory management. Frequently demand of the product can be achieved by cycle inventory. Cycle inventory are ordered in lot sizes and on a regular basis.

2.4 INVENTORY SYSTEMS :

Inventory system is the process that enables the organisation to track goods throughout supply chain, from purchasing of raw materials to distribution of finished goods. There are two types of inventory system : Periodic (Manual) inventory perpetual inventory systems and systems. The main difference between these two is frequency of tracking.

2.4.1 Manual or Periodic Inventory System :

Earlier when computer was not available or digital technology was only in reach to certain people/organisation, other used to keep track of inventory manually by counting items in stock. It is people intensive job where different types of registers, forms, and so on were used for keep track of stock. The inventory is recorded manually by use of physical counting. This system is unable to track inventories on a continuous basis. The system provides the beginning and ending inventory levels during a certain specified period of time. Periodic inventory systems rely on a physical count of the materials at the start and end of the time period. As a result, inaccuracies can be done. Time consuming, labour costs for the inventory count etc. do not make this system suitable for large establishments however smaller establishment with limited inventory are using this system.

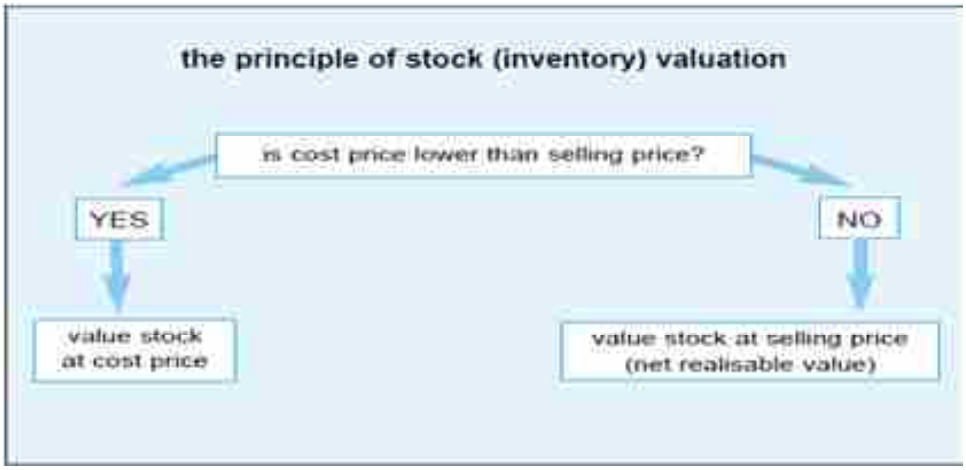
2.4.2 Perpetual Inventory System :

It is digital method of recording the movement of stocks. In this system by use of computerised point–of–sale systems and enterprise asset management software the sale or purchase of inventory recorded immediately. Perpetual inventory provides a highly detailed view of changes in inventory with immediate reporting of the amount of inventory in stock, and accurately reflects the level of goods on hand. There is no need of extra efforts at keeping detailed inventory records of products on hand; rather, purchases of goods are recorded as a debit to the inventory database. A perpetual inventory system is distinguished from a periodic inventory system, a method in which a company maintains records of its inventory by regularly scheduled physical counts. These systems also provide up–to–date records that reflect stock levels.

2.5 STOCK/INVENTORY VALUATION :

Inventory counting and recording in not end job in inventory management system. You also need to know the assets what you have, that means value of goods also must be recorded. Establishment held stocks in the form of raw materials, work–in–progress, finished goods, products bought for resale, service items, and so on. It doesn't matter whether the value of such stock is high or low but, it represents a considerable amount of money and so it is important that it is valued consistently, and proper controls are kept over the physical stock.

At the end of every financial year, essentially every company need to submit their financial statement. It includes profit and other financial transactions. The physical stock–take helps in valuation of stock and it is use in the financial statements in the calculation of profit, and for the balance sheet. Counting of each item held in stock is done prior to preparation of balance sheet. The stock value is calculated by using formula



Stock Value = Number of Items Held X Cost per Item

Stock valuation is the monetary amount associated with the goods in hand at the end of financial year. Some organisations prepare stock valuation bi–annually, or quarterly as per their convenience to make hustle free closing of financial year. The valuation generally is based on the costs incurred to acquire the inventory and get it ready for sale. Inventories held are the largest assets present in business.

2.5.1 Method of Stock Valuation :

As we know stock valuation is a method of determining the intrinsic value or theoretical value of a stock. The stock valuation methods depend on stock

tracking over a period. Organisation must have to value inventory at cost. The price of goods is dynamic in the market and stocks are being sold continuously it is restocked too so, the establishment makes a cost flow assumption that it will use frequently. Inventory valuation also helps in evaluation of COGS (Cost of Goods Sold) as well profitability. The most widely used methods for valuation are FIFO (first–in, first–out), LIFO (last–in, first–out) and WAC (weighted average cost). There are four accepted methods of inventory valuation.

- Specific Identification
- First–In, First–Out (FIFO)
- Last–In, First–Out (LIFO)
- Weighted Average Cost (WAC)

2.5.1.1 Specific Identification :

In this method, tracking of every item in inventory is done from the time of stocking to sell. It is ideally used for large items that can be easily identified by its features and costs associated. This method has high degree of accuracy to the valuation of inventory; it is restricted to valuing rare, high–value items for which such differentiation are needed. In this method RFID tagging is best way to track each items individually.

2.5.1.2 First–In, First–Out (FIFO) :

The inventory purchased earlier must be sold first in other word in which order a particular item is purchased has to sell in that order only, so that no item laps its use by date. Especially items like milk, fruits, vegetables, eggs, meat, and so on deteriorate its quality over a time. Other inventories are also matched to the assets that are most recently purchased or produced. As it is simple and easy to understand it is one of the most common methods of inventory valuation used by many organisations.

2.5.1.3 Last–In, First–Out (LIFO) :

LIFO system says the newer stock must be sold first while the older stock remains in stock. This method is rarely preferred by organisation because the older inventories can gradually lose their value. This results in significant loss to the business. Still there is only one reason to use this method is expectation to increase cost of inventory over time and may lead to price inflation. By moving high–cost inventories to cost of goods sold, the reported profit levels businesses can be lowered. This also allows businesses to pay less tax.

2.5.1.4 Weighted Average Cost (WAC) :

In WAC system of stock valuation, the weighted average is used to determine the amount that goes into the cost of goods sold and inventory. This method is commonly used to determine a cost for units that are indistinguishable from one another and it is difficult to track the individual costs.

2.6 STOCK CONTROL AND ISSUING :

Now it is essential to have proper accounting of stock in hand. There are varieties of products stored in store which is stored to use whenever required in process. Continuous rotation is required at several stages of process. These items are issued to concern departments against proper authorised requisitions. Requisitions are document states the particular department's requirements at particular time. A storekeeper has sound technical knowledge of the products with

its shelf life. He must have ability to deal with suppliers, own staff, and personnel from other departments as well as the management. He counts and measures issued and remaining stock by keeping up–to–date records on costs and level. Typical Stores and stock control involves Ordering, Delivery of goods and Storage. Developing an efficient and effective control system enables :

- Proper and efficient stock rotation that improve and maintain standards
- In case of discrepancies order and delivery the items can be borrowed from other sections
- Reduction in excessive stock that may constitute a safety risk and reduce cash flow
- Monitoring of use and product evaluation
- Budgetary control
- Standardisation of quality

2.6.1 Stock Records :

As we know it is essential to maintain clerical record of every stock movement accurately for smooth storage function. It depends on the size and frequency of movement what system should be used. Upon arrival at the store goods are recorded and mentioned in goods receiving book.

Consumption sheet is prepared as per requirement of organisation either monthly or fortnightly, however daily consumption report is also prepared to support monthly or fortnightly consumption sheet. These sheets contain total items used on particular date. It also assists operational budget preparation.

Beside this in a particular time duration stock taking activity is done. For instance beverages (especially miniatures of alcoholic beverages : Whisky, Rum, Gin, Tequila etc.) need daily consumption report to mitigate demands as well as misuse of it. It is also depend on policy of establishment that how frequent the stock taking should be. It may either done weekly/fortnightly, monthly or quarterly or yearly depending on the policy of the establishment and may vary organisation to organisations. It is an essential process to prove the accuracy of the stock records and hence carried out in close supervision of departmental head and/or an external auditor. Usually this is carried out during lean hours of operation and during stock count movement of goods are avoided. In case of any discrepancy it is investigated wherever necessary.

The system of issuing goods from the stores to operational departments may vary but the system of issuing still exists in operation. No issue is made without authorised requisition slip that also ensures accountability of issued items as well as prevents from misuses.

Not only stores but the receiving person (the department who indented for issue of goods) also should ensure and check the weight, quantity as well as specifications what the intended to receive. Accuracy is very important for both store as well as the department before the receiving of store goods for their operations. It depend on policy of establishment that whether the issuing is done on daily, weekly, or monthly basis.

Basically issuing is the process of moving goods from storage rooms to areas of operation or customer goods delivery points. Inflight catering stores issued the goods to production areas to the chefs as well as to the on–board staff for serving to passengers. Items such as face towel, ear pods, sugar sachets, and

tea bags and so on that is directly served to individual passengers are issued to on–board supervisor.

2.6.2 Stock Security :

Security includes both internal as well as external theft. For this every inwards and outwards are closely inspected by security department before the exit gate (all hospitality organisations have separate staff entrance that can also be used for receiving goods from the suppliers) without proper consent no entry is made. Another responsibility lies to store department is to keep stock secure with misuse, theft and so on conditions. As the records are updated very often it is easy to know what you have, where it is located and how much it is worth. Portable stocks does not having the business' logo, or is easy to sell on, are at particular risk.

To keep your organisation free from threat of theft, you have to be careful about access from outside any unauthorised access must be avoided. A regular security check–up for any unusual movement around premises to keep the risk to a minimum is necessary. Beside this theft may be done by staff, many organisations follow security check for all the staff during "IN" an "OUT" at staff entrance. But it has to be in routine and included in policy, to avoid any biasness or misinterpretation by staff. Some establishment also set a maximum limit of amount a staff can carry with him inside the premises more than that they can mentioned in "IN & OUT" register present at entrance. In case of any discrepancy security personnel can inquired.

❑ Check Your Progress :

1. The technique is zero inventory system is

   (a) DIO (b) JIT (c) EOQ (d) COG

2 A demand fulfilment method where supplier purchases the item from a third party and shipped directly to the customer is called :

   (a) JIT (b) Smart purchasing

   (c) Drop shipping (d) None of the above

3. Which inventory value system is in use when products are valued at the cost of the most recently received products ?

   (a) LIFO (b) FIFO (c) FILO (d) FFFO

4. When beverage products are delivered, the vendor's delivery invoice should be compared with the _____.

   (a) Purchase specification (b) Credit memo

   (c) Purchase order (d) Purchase requisition

5. PMS acronym stands for _____.

   (a) Purchase Management System (b) Property Management System

   (c) Product Management System (d) None of the above options

6. The time it takes a supplier to deliver goods is called as _____.

   (a) Lead time (b) Safety level

   (c) Usage rate (d) Vendor minimum

7. The process of comparing physical stock with stock records is known as:
   (a) Stock tracking (b) Inventory reconciliation
   (c) Physical Inventory (d) None of these
8. Unsold items which are lying in your warehouse or your store for a long time.
   (a) Dead Stock (b) Remove storage
   (c) Deduction authorization request (d) Inventory adjustment

2.7 LET US SUM UP :

Stocks valuation is an extremely complicated process that can be generally viewed as a combination of both art and science. Investors may be overwhelmed by the amount of available information that can be potentially used in valuing stocks (company's financials, newspapers, economic reports, stock reports, etc.).Therefore, an investor needs to be able to filter the relevant information from the unnecessary noise. Additionally, an investor should know about major stock valuation methods and the scenarios in which such methods are applicable. Stores have stocks or inventories held in the form of raw materials, work–in–progress, finished goods, products bought for resale, and service items. At the end of the financial year, the company must make a physical stock–take and value its stock for use in the financial statements in the calculation of profit, and for the balance sheet. In order to be able to calculate accurately the price at which stocks of materials are issued and to ascertain a valuation of stock, a stores ledger record or stock card is used. A stock–take is carried out regularly to check that the quantity of stock held is the same as that recorded in the stock records. A stock–take is carried out on either a periodic basis or continuously.

Stock reconciliation is the process of comparing the stock–take and the stock record. Small shortfalls in physical stock may be authorised for write–off by the company's managers or auditors; larger discrepancies will need to be investigated to establish their cause.

2.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. (b),	2. (b),	3. (b),	4. (c)
5. (a),	6. (c),	7. (b),	8. (a)

2.9 GLOSSARY :

Cost of goods sold : also known as cost of sales, It refers to the direct costs of producing goods. This includes the cost of the materials and labour directly used.

Dead stock : refers to any unsold items which are lying in your warehouse or your store for a long time.

Decoupling inventory : Also known as safety stock or decoupling stock; refers to inventory that's set aside as a safety net to mitigate the risk of a complete halt in production if one or more components are unavailable.

Demand analysis : the process of understanding the customer demand for a product or service in a target market.

Economic order quantity (EOQ) : EOQ refers to how much you should reorder, taking into account demand and your inventory holding costs.

Finished products : or finished goods inventory, means the number of manufactured products in stock that are ready to sell.

Holding costs : Also known as carrying costs; the costs your business incurs to store and hold stock in a warehouse until it's sold to the customer.

RFIDtags : a type of tracking system that uses smart barcodes in order to identify items. RFID is short for "radio frequency identification"

Landed costs : These are the costs of shipping, storing, import fees, duties, taxes and other expenses associated with transporting and buying inventory.

Lead time : The time it takes a supplier to deliver goods after an order is placed along with the timeframe for a business' reordering needs.

Order fulfilment : The complete lifecycle of an order from the point of sale to pick–and–pack to shipping to customer delivery.

Order management : Backend or "back office" mechanisms that govern receiving orders, processing payments, as well as fulfilment, tracking and communicating with customers.

Pipeline inventory : Any inventory that is in the "pipeline" of a business' supply chain e.g., in production or shipping – but hasn't yet reached its final destination.

Reorder point : Set inventory quotas that determine when reordering should occur, taking into account current and future demand as well as lead time(s).

Safety stock : Also known as buffer stock; inventory held in a reserve to guard against shortages.

Sales order : The transactional document sent to customers after a purchase is made but before an order is fulfilled.

Stock keeping unit (SKU) : Unique tracking code (alphanumeric) assigned to each of the products, indicating style, size, colour, and other attributes.

Third–party logistics (3PL) : The use of an external provider to handle part or all of your warehousing, fulfilment, shipping, or any other inventory–related operation.

Fourth–party logistics (4PL) : takes this a step further by managing resources, technology, infrastructure, and full–scale supply chain solutions for businesses.

Variant : Unique version of a product, such as a specific colour or size.

2.10 ASSIGNMENT :

1. Discuss the purpose of an issue requisition.
2. What is the purpose of a stock–take ?
3. What is meant by stock reconciliation ?
4. What is the importance of physical and perpetual inventory systems ?
5. What is the difference between physical and perpetual inventory systems?

2.11 ACTIVITIES :

1. Visit any warehouse near your locality and understand inventory management of that warehouse.
2. Inquire about storage management of SLM of your university.

2.12 CASE STUDY :

Emirates Flight Catering (2.5 Km Mono Rail System Transport the Carts through the Plant)

Key data of the facility

- Service package 1

6 automatic warehouses for small parts with :

- 3500 statistic positions
- 4200 positions in flow racks

Bin handling technology

- Service package 2

Electric monorail system :

- 110 – 180 carriers
- More than 2.5 km of rails
- 110 track switches
- 15 elevators
- 28 work stations

❖ **The biggest flight kitchen in the world 115,000 meals per day**

The logistics on the ground for the catering on board of an airplane is a logistic masterstroke. For each flight 25 to 40 trolleys, so–called 'carts', are provided just–in–time. Besides hot meals and cold drinks, duty–free products, blankets, headphones and many more go aboard. The content of the carts is exactly concerted to the type of flight, the airline and the destination of the flight.

Emirates Flight Catering has recently built the biggest and state–of–the–art plant of this kind. The logistic backbone of the plant is an electric mono rail system (package 2), which transports the carts through the different stations of the flight kitchen. The control and instrumentation technology ensures that the right cart is at the right place at the right time.

There is such a great variety of dishes and cutlery that 6 automatic storages for small materials were built for this.

Via a bin handling technology the right plates and forks are provided automatically (package 1).

❖ **Scope of Unitechnik contribution**

Control technology for service package 2 :

- x PLC S7–400 (CPU 416)
- Profibus–DP with about 200 local stations

Safety engineering :

- Locally with Pilz safety modules PNOZ 'Multi'

Warehouse management system for both service packages :

- Material flow and warehouse management software, as well as plant visualization on basis UniWare

- 40 computer terminals
- Cluster server with Oracle data base
- Network infrastructure

Switchgear construction assembly

Commissioning and training

Overall responsibility :

- Package 1 : Interroller (Singapore)
- Package 2 : Schierholz (Bremen)

2.13 FURTHER READING :

1. Principles of Supply Chain Management : A. G. Leong
2. Air Cargo Management : Air Freight and the Global Supply Chain by Michael Sales
3. Meredith, Jack R., and Scott M. Shafer. Operations Management for MBAs. 2nd ed. New York : John Wiley & Sons Inc., 2002.
4. Stevenson, William J. Production/Operations Management. 8th ed. Boston : Irwin/McGraw–Hill, 2005.

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UNIT 03

Kitchen Organisation & Management

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- Examine the factors to be considered in designing the kitchen layout
- Understand the work flow in a production kitchen
- Understand alternative systems for holding food safely
- Identify alternative approaches to tray assembly and trolley loading
- Explore the complexity of production scheduling
- Identify how meal production is managed
- Understand tray assembly and flight assembly processes
- Understand how flight production units are organised and staffed

3.1 INTRODUCTION :

As it is claimed by various authors, Flight catering is probably one of the most complex foodservice operational systems in the world. For instance, Cathay Pacific Catering Services'. A Flight kitchen produced more than 70,000 sets of meal per day. However in pandemic or other adverse situations the figure could be reduced. TajSATS itself caters 370,000 flights per year and there are so many catering services providers having kitchen at various locations. Flight carries thousands of passengers per day. These kitchens prepare food for thousands of these passengers. So the size of ground kitchen must be large and have to well equip to meet demands. These kitchens also required huge numbers of chef and kitchen stewarding personnel. After preparation of food, it is packaged and prepares it for delivered to the loading persons who transport it to airlines. The main elements of flight caterers are the preparation of food and materials (hot and cold food, beverages, and equipment), tray assembly, and flight assembly. There are several flight kitchens all across globe. The practices among these kitchens operated by different companies may vary. However the main objective of all of them is to achieve customer satisfaction, customer retention or flying back. For specific operations, local variations can be seen because of :

- Size of the operation (number of tray to be prepared)
- Type of operation/passenger served (Domestic or International)
- Sophistication of the flight service
- Number of airlines handling
- Number of flights serviced in a day
- Duration of the flights serviced

3.2 OBJECTIVE OF COOKING :

Cooking is an act of preparing food suitable for consumption and make easily digestible. Cooking is majorly done by the application of heat on it. It includes various methods, tools, techniques and combinations of ingredients to alter the colour, flavour, aroma, and digestibility as well palatability of food (as eating is not only done by injecting the food into mouth but, eyes, nose and mood are also involve in eating process). The process of cooking starts with selection and combination of ingredients to achieve desired result. Besides ingredients other elements like ambient conditions, tools, and the skill of the individual doing the actual cooking also makes food more acceptable. The objective of cooking includes :

Increase in palatability : By cooking food it increases the eye appeal and is receptive to the palate and helps to stimulate the digestive juices, thereby creating an appetite.

Enhances flavour : Various ingredients use to give flavour encompasses with food, by cooking become active due to activation of enzymes present on it.

Retention of nutritive value : While cooking food the fibres and nutrients present in food become softer as well as easy to digest easy to synthesise in body.

Provide balanced to meal : The different ingredients combined together in one dish make it easier to provide a balanced meal.

Act as a preservative : Cooking preserves food for a longer time. Bacteria present in raw food destroy with the application of heat, and the chances of spoilage become lower hence shelf life increases also reduced the chances of food poisoning and food related diseases if stored properly.

Give varieties to the menu : Different methods of cooking (viz. Roasting, Baking, Boiling, Steaming, Stewing and so on.) when are used it to give variation in taste, appeal and so on. This enables variety of choices for consumer without repeating. For example : with one raw material say mutton, you can make– seekh or Boti Kebab, Shookha gosht, Bhoona gosht, stews or you can make Mutton Paya Soup, choice is all yours. Change in cooking method makes the dish develops new flavours in food.

3.3 ORGANISATION OF PRODUCTION UNIT :

Airline catering system is designed and organised in such a way so that the right quantity and quality of food can be produced. The correct standard of food is needed to be delivered for the required number of passengers, on time. It is therefore required to use the available resources either staff, equipment or materials, effectively and efficiently. The main constraint in airline catering is to produce and deliver with maintaining food temperature adequately (hot food has to serve hot and cold food cold), at the same time it is also important to serve it in a stipulated time. Production unit of airline catering is differing from other catering units in service by distance and time. All these aspects make the operations more complex catering process. Chef has to plan and design the operation and the entire unit. The designing and planning covers a logical sequence of procedures, quality and quantity deliverance involved in it. The design provides in–depth analysis of functional requirements, effective flow and balance between all stages of the process.

3.4 PRINCIPLES OF FLIGHT FOOD PRODUCTION UNIT DESIGN :

Kitchen or food production unit of an in–flight catering system is a prominent and enclosed section where ingredients are brought together, gathered, combined through proper processing to give it delicacy. The process includes cleaning, storing, Mise–en–place (me–zohn plahs), cooking, holding food materials and dishes, plating, washing up, waste clearing, etc.

Kitchen unit is design to ease the entire process of food production. The unit design implies complete design and scope of set–up in a way how it is planned. The processes have several stages. These stages are : identification and selection of the products to be cooked or prepared, feasibility analysis and judgement, design, economic evaluation, selection & procurement of equipment

required installations. It is highly required to consider flows of raw material in entire processing. Therefore plant layout is designed in such a way so that any hustle and potentiality of hazards can be avoided. Placement of equipment, storage areas, receiving areas, food preparation areas, dishwashing section, waste disposal areas, packaging & delivery points, entry and exit points etc. are some important areas for any food production unit, so it is planned very carefully. The entire food production is closely monitored by executive chef, so the chef's cabin must be located in an area from where the entire process can be monitored simultaneously. Some of the vital aspects for efficient and successful planning of in–flight catering are Production methods, Cooling techniques, Supply and disposal plans, Dishwashing system and Logistics systems. There is continuous rise in cost of space, equipment, fuel, maintenance, and labour, the requirement of integration of process, organisation, and systems have increased and the unit must facilitate to meal production for serve on board the aircraft. It is therefore necessary to understand the functionality of production and organisation, before go for production planning and operational activity. For a successful kitchen operation, layout design is one of the most important aspects. The level of competency, efficiency and effectiveness can be judge by layout of the kitchen design. The key concepts all relate to improving unit productivity are decrease in the volume of in–process materials (just–in–time approach), improving productivity of labour, and reduction in waste. Typically systems are designed in such a manner so that **:**

- The plant layout is process–driven
- Automation of equipment
- Simplified flow of both raw as well as finished food
- Close co–ordination of staff handling process
- Scope of continuous inventory updating
- Transparency in fault recording
- Rectification of faults

The processing and handling method may vary from unit to unit depending on the production system followed. An in–flight caterer mainly follows Batch production, Continuous production, Cell production or combination of all.

3.4.1 Batch Production :

This system enables production in a small quantity at one time and only when required. The advantage of this is speed and consistency. However, many handlings can result in poor staff utilisation and higher risk of wastage is the side effects of it. This process type is ideal and adopted for the production and tray assembly of first–class meals and preparation for special flights and special meals.

3.4.2 Continuous Production :

It is based on high volume utilisation of equipment. In this system identical meals are produced in large numbers and then allocated to the concern sections of kitchen or flight for further processing. For example sauce or gravies are prepared and send to the section where it is required. The benefits of this system are consistency and low wastage. However, bottlenecks can occurred at peak times due to slow speed of production. The system is not suitable for items with small or highly variable volumes, especially for first–class, business, and special meals. Another lack of this system is if one department falls behind schedule, the rest of the departments have to wait for the flow as they are dependent on this department.

3.4.3 Cell Production :

It is a manufacturing system; the workforce is split into independent teams to complete a particular product. Every member of the team has to multi–skilled, flexible in their job throughout the production through. Majorly flight production systems design is based on the cellular manufacturing principle, where the machines and equipment is configured in groups of related to each part. That means there is a collection of cells dealing with different but related process. This system combines both elements of the batch and Continuous production. By applying this system is to reduce time involve in the whole process. Modern equipment such as combination ovens, Bratt pans, food processors etc. is multi–purpose equipment which has multiple functions, is employed in in–flight catering. All these equipment can't be used in individual cells only but in multiple cells. It is depending on production quantity requirement how these equipment are used.

Beside these advantages of cell production some lack is also associated with this. The quality of product may vary depending on the individual cells, therefore requires closed monitoring and careful planning. At the same time there is a great risk of cross–contamination, since it is multiple handling.

3.5 PRODUCTION PLANNING :

It is important to balance the meal demand as per requirements of each airline by keeping available resource in mind. The plant need to operate at maximum efficiency in terms of labour, food and equipment. Therefore the plan for production process need to very careful and well planned. As it says the production plan is a guide for the operations of upcoming time. Process flow planning system is required close co–ordination with ground transportation materials handling, processing and storage to the procurement of materials. Firstly menu planning and designing is required to formulate a production plan. Then it is require for purchasing process of ingredients.

In–flight catering service resembles characteristics of food manufacturing plants in terms of preparation like food manufacturing plant whereas; the way food is served on trays to passengers is like the styles in pre–plated service in restaurants. Ideally the hot kitchen space in a production unit i.e. kitchen is not more than 10% of the total carpet area. The rest of the space is used for stores which require refrigerators shelves and rack. Tray and trolley assembly also require huge area, and flight wash–up is very important for smooth functioning of process these areas should be considered along with area of cold section where major flight food is prepared. The way food and equipment is stored resembles a freight warehouse, and the way meals and equipment are transported and supplied has a close affinity to military–style logistics and distribution systems.

3.5.1 Production Scheduling :

On the basis of expected number of passengers production plan is scheduled for each day operation. A separate but associated schedule for individual sections of the production viz. cold kitchen, hot kitchen, bakery, confectionary, butchery and so on, is planned and scheduled. These scheduling is done on the basis of loading times for an airline. It is also ensure to minimise food–holding stages with efficient delivery. The system calculates the items and staff requirements per flight, crew requirements, and advanced reservations. The key component of this are : priorities of food requirements and volume, maximum utilisation of available resources and time.

3.5.2 Production Control :

Now it's time for execution of plans that means whatever planned it must be followed in same manner as it is scheduled and planned. Unavoidable situations like Equipment breaks down, staff fall sick, suppliers fail to deliver, and so on is already considered during planning and at the same time back–up also has been planned. The main function of production control is to ensure that production is maintained in line with the production plan wherever possible along with coping up with on–going issues if any encountered during process. It is responsibility of production managers to have continuous monitor the supply, process and up–to–date about outcome of task carried out till now and corrective action whenever required.

3.5.3 Sections of Kitchen :

Kitchen is not only about cooking but storing, packaging and delivery also. Flight kitchen need to be divided into sections for efficient effecting and smooth function. These are : Hot section, Cold section, Bakery & confectionary etc.

Cold Kitchen : In–flight meal normally focused to serve cold food as it is the most suitable items both in terms of serving as well as consuming. It is also noted that aircraft have limited oven capacity. At the same time handling of hot food increases the service complexity. The preferred on board meals may be salads, sandwiches and so on. Therefore food can be prepared in a chilled room. At ground the foods like salads, sandwiches, hors d'oeuvres, cold meats, sweets and so on cold items are prepared, portioned and packed for flight supply.

Hot kitchen : This section kitchen is normally situated on central cooking island. Section is responsible for fulfilling of requirement of preparing gravies, hot sauces (which are served cold like : white sauce, veloute sauce and so on.) need to prepare by using heat so the hot section is also need to be planned.

Bakery : It is also a type of hot kitchen, which specialises in making bread, cake, muffins and other baked goods. This section is separated from the main kitchen. Vital function includes preparation of hot and cold sweets, pastry, and ice–cream based sweets.

Dishwashing or Pot–wash : Area is situated near the hot kitchen and bakery areas. Responsible for timely supplying of washed utensils for all sections.

3.6 COOKING PROCESS :

The cooking process starts with mise–en–place after receiving of ingredients from stores. Some items are also stored in kitchen storage areas. For cooking food many methods of cooking is applied to airlines kitchen also, although deep fat frying is avoided as food cooked by this method loses crispiness while chilled and reheated, due to presence of moisture in food gradually turning to steam during the regeneration. After cooking the cooked food is transferred to bulk storage containers (tagged with the day of production) and rapidly chilled in blast chillers for safe storage. The JIT systems is most applicable in flight kitchens, mostly the cooked food is served within 24 hours of production. Cook chill, cook freeze and sous vide system can be widely seen in airlines catering kitchen system.

3.6.1 Cook Chill System :

It is based on normal preparation and cooking of food followed by rapid chilling then stored in controlled low–temperature conditions above freezing point, 0°C to 3°C (32°F to 37°F). Food is then subsequently reheated immediately before consumption.

3.6.2 Cook Freeze System :

With the advancement and development blast freezers have played a great role into catering operations. The system allows portioning of cooked dishes before freezing it at around –20°C. Food is then subsequently reheated immediately before consumption.

3.6.3 Sous Vide :

It is a form of cook–chill where a combination of vacuum sealing in plastic pouches, cooking by steam and then rapidly chilled. The objective is to rationalise kitchen procedures without having a detrimental effect on the quality of individual dishes.

3.7 EQUIPMENT REQUIRED FOR KITCHEN :

Kitchen equipment is expansive items therefore it must be efficient. Proper care and maintenance is required for maintaining its efficiency. While selecting equipment for kitchen operations, it is necessary to keep in mind about the capacity, purpose, quality, design and ease of clean. Normally branded items from trusted supplier is advisable to select. The equipment requirements depend on these factors as well as the operating sections and frequency requirement also.

3.7.1 Hot Kitchen Equipment :

This area uses large–scale equipment, such as fryers, boiling pans, Bratt pans, continuous cookers, tilting frying pans, grills and char broiler, steamers, convection and combi–ovens, exhaust fans for sophisticated ventilation systems.

As the foods are cooked in batches by following the standard recipe continuously so equipment needed to be heavy duty and durable.

3.7.2 Cold Kitchen Equipment :

The section requires mainly preparation tables, washing and peeling machines, vacuum tumblers, high speed cutters, slicing machines, coloured chopping blocks and knives, and refrigerated storage.

3.7.3 Bakery and Confectionary :

The basic equipment required for flight catering bakery and confectionary section includes mixing machines, moulding machines, dough mixers, kneading machines, programmable ovens, pastry–rolling machines, cream–whipping machines, weighing scales, proving and baking ovens, rolling pins. Depending on frequency of operation flour is stored in silos and transferred pneumatically along pipelines directly to weighing hoppers located over the mixing machines.

3.7.4 Dishwashing :

Large commercial utensil–washing machines are required to wash pots, and food containers used in various sections of the kitchen. Normally, spray jet or foam cleaning breaks is used in cleaning system.

3.7.5 Fruit and Vegetable Preparation Area :

This area requires sinks attached with stainless steel tables for washing vegetables for manual operations, beside this peeling, shredding, cutting/dicing machines and vegetable–washing machines, spin–drying machines, tomato–slicing machines, and waste disposal bins.

3.7.6 Other Equipment :

Other equipment is trolley & plating equipment. Hand–washing sinks and hand–drying equipment is also required to place at entrance of sections. Trolleys are used to transportation of food. Things such as headsets, first aid boxes, blankets crockery and cutlery so on are transported in trolleys on a flight even though they are not needed for that flight. This is referred to as 'dead–heading'.

3.8 HACCP (HAZARD ANALYSIS AND CRITICAL CONTROL POINT) :

It is moral as well as operational responsibility of airlines caters to ensure and provide safe food with concern to avoid food poisoning and contamination to the consumers either passenger or crew. In order to health safety HACCP (Hazard Analysis and Critical Control Point) approach has been implemented in 1993. Basically HACCP is internationally recognised management system by which the analysis and control of biological, chemical, and physical hazards in food through various stages like production, procurement, handling, and consumption food is done. It identifies and manages food safety related risk as well as provides guidelines to avoid such situations. It also provides education and training about implementation and maintenance of the HACCP guidelines.

Airline caters are adhere to the principles of HACCP and is supported by the management and staffs as a result the microbiological quality of aircraft meals is improving significantly. For assurance of quality and provide safe food as much as possible, industry standardised the procedures and row material quality. They providing safety measures for food handlers so that chances of contamination can

be minimised. All these practices not only reduce the cause errors in operation but customer dissatisfaction. It is also been observed that, since 2008 the growing importance of HACCP to provide safe food. However, food safety in not only assured with HACCP, but other factors such as hygiene and sanitation in area and food, pest control, traceability & recall, also need to be developed and implemented to avoid the risk of food poisoning, foreign objects during handling. In Addition, suppliers and distributors also need to ensure the safety guidelines of food.

3.9 STAFFING :

Success of a kitchen is depending on the workforce associated with it. If we say kitchen layout and equipment placed is body of the kitchen, then the staff is its breath. The staffs are technically called the kitchen brigade.

The kitchen jobs require a high level of patience, proficiency, efficiency, dedication, competency and compassion for various jobs. It is their attitude and a craving for excellence and perfection that makes variations of food and plating that enhances customer satisfactions. Kitchen personnel are able to handle extreme work pressure and maintaining calm attitude under such pressure and heat. Kitchen starts its day with preparation of breakfast, brunch, lunch, afternoon tea, hi–tea, dinner and so on. These meals need to be delivered within stipulated time. Preparation involves a great deal of time and has to be finished on time and complaints regarding order delayed may occur from the guests.

So we can say the process of food delivery to passengers requires a lengthy and careful process. Different types of staff required for preparing and cooking meals, assembling equipment, laying trays, and assembling the trolleys together for each flight in a large number. Additionally production unit also need to employ some person for stores, drivers and loaders for the transportation of meals, and in dishwashing and cleaning. At the same time administrative staff for production planning, scheduling, invoicing, sales and marketing and personnel. In addition, there may be requirement of some highly specialist staff such as laboratory technicians to monitor food safety, halal or kosher chefs, and so on. The operation need to be carried out round the clock daily (24x7x365, no holiday for unit) to meet the demand so the staffing is done with consideration of two or three shifts per day. This may vary from unit to unit as per operational requirement and organisational policy.

A production unit have varieties of deals like manual and mechanical handling tray assembly by human and by robotic machines, dish–wash by dishwasher or dishwashing machine and so on, these varieties are directly related to high skilled and low skilled staffs, some areas may work with unskilled staff. Whatsoever skill requirement is does not affect the number of staff that means you must have adequate number of staff for smooth functioning of your operation. At the same time there are also variations in high skilled and expertise staff, however it can be said that only chef is having a high degree of training, skill, and expertise in the production area.

3.9.1 Flight Catering Chefs :

Unlike other catering organisations the flight caters may need to employ both R & D (Research & development) team of chef as well as operational or production chef. The research chefs specialise in developing and trialling new dishes for flight catering whereas the production chef is responsible on a daily basis meal production. As we have learn while learning Passengers Appetite and

Behaviour (Block – I, Unit – 4), we came to know that due change in taste receptors at high altitude food and drink when consumed may taste very different to the ground taste. Thus, a continuous development needed to be conducted in flight kitchens for dish and recipe. Both the production chefs and development chefs need different sets of skills or competencies to each other in order to perform their different aspects and nature of tasks. However, both chefs required to have :

- Time management skills
- Knowledge of culinary fundamentals and production systems
- Knowledge of kitchen functions
- Ability to handle pressure situations
- Knowledge and ability to quality assurance and food safety
- Multitasking
- Decision making ability
- Verbal and written communication skill
- Through understanding food testing
- Knowledge and applications of ingredients
- Food presentation skills

3.9.2 Scheduling and Roster of Staff :

Usually it is the responsibility of heads of operating departments to plan and organise duty roaster fortnightly or monthly basis. Some organisations however plan weekly, but in round the clock operations fortnightly or monthly planning is ideal. Scheduling and roster of the staffs plan and then check by computer against the production plan and schedule, in order to ensure working efficiently and load of work is shared by all staff equally. For that estimated number of work hours, number of meals, tray assemblies, nature of the airlines and the contracts being serviced etc. are considered. Some units employ a proportion of core staff on a full–time basis throughout the year, and then use part–time or casual non–skilled staff during high demand.

❑ Check Your Progress :

1. TajSATS is flight catering company of _____ group

   (a) Birla (b) Reliance (c) Tata (d) Adani

2. Objective of cooking food includes :

   (a) Palatability

   (b) Enhances flavour

   (c) Retention of nutritive value of food

   (d) All of the above option

3. Mise–en–place is a French cooking term used in professional kitchen mean

   (a) To put in place (b) To put out of place

   (c) To place order (d) To minimise order

4. Flight catering kitchen is not only about cooking but storing, _____ and delivery also.

   (a) Purchase (b) Produce

   (c) Packaging (d) None of the options

5. Cook Chill System food is stored between _____ to _____ degree Celsius

(a) – 20 °C to – 10 °C (b) – 10 °C to – 5 °C

(c) – 5 °C to 0 °C (d) 0 °C to 3 °C

6. Bratt pan is _____.

(a) Cold kitchen equipment (b) Hot kitchen equipment

(c) Bakery equipment (d) None of the above options

7. Full form of HACCP is Hazard Analysis and Critical Control Point.

(a) True (b) False

8. Production chef and _____ chef are two main chef in flight catering.

(a) Development (b) Chef de cuisine

(c) Kosher (d) Chef de partie

3.10 LET US SUM UP :

A catering system need to be designed and organised in order to produce the right quantity of food with adequate standards for the determined number of people, on time, by using available resources such as staffs, equipment and materials effectively and efficiently. The main constraint in airlines catering is that the production unit is located distant from service area and hence involve time in delivery to the flights.

Design of the operation become important because of complexity of the operations in terms of numbers and meal components, catering and process engineers have to be heavily involved in it. In order to get success in the kitchen, thorough knowledge of equipment is essential. Few foodservice operations depend on nothing more than a range and an oven, an assortment of pots and pans, and knives and other hand tools. Modern technology continues to develop more and more specialized and technically advanced tools to reduce kitchen labour. Much of this equipment is so complex or so sophisticated that only first–hand instruction and practice will teach you how to operate it effectively and safely. Other items, especially hand tools, are simple and need no explanation but require much practice to develop good manual skills.

Hygiene inspections and/or microbiological testing do not guarantee food safety however we need to follow few of them. A better approach is the application of the hazard analysis critical control points (HACCP) concept.

3.11 ANSWERS FOR CHECK YOUR PROGRESS :

1. (c), 2. (d), 3. (a), 4. (c)

5. (d), 6. (b), 7. (a), 8. (a)

3.12 GLOSSARY :

Bratt pan : a heavy duty commercial cooking appliance which is able to perform up to eight cooking functions : braising, boiling, steaming, poaching, stewing, roasting, and deep–fat frying and shallow frying.

Duty roster : also called Duty rota, is a format that shows the allocations of duties to staff for day to day operation.

Hazard : any source of potential damage, harm or adverse effects on something or someone.

Mise–en–place : It is a French cooking term used in professional kitchen; literal meaning is "to put in place". Simply it is gathering and preparing all the ingredients before cooking. Cleaning, washing, peeling, and cutting etc. are main activity under this.

3.12 ASSIGNMENT :

1. Write the name of all kitchen equipment used in different sections.
2. What is HACCP ? Explain in detail.
3. How production planning is done for flight catering kitchen ?
4. Write a short note on working of flight catering chefs.

3.13 ACTIVITIES :

1. Visit nearby commercial kitchen (at least 4star category) and make a list of process followed in order to maintain food safety.
2. Visit any FMCG (Relience Fresh) and observed the stacking patterns of goods sold.

3.14 CASE STUDY :

❖ **Continental Airlines Catering Equipment Control System :**

Continental Airlines, in conjunction with Jet logistics and Calibre, have developed an integrated system for managing their catering equipment. The system was designed to achieve a number of objectives **:**

- Provide accurate knowledge of flight equipment requirements in relation to menu specifications and provisioning codes
- Identify equipment movements between stations
- Forecast passenger numbers
- Provide accurate aircraft configurations
- Enable the reporting of regular equipment stock taking by caterers in all
- stations
- Provide data about equipment sector life
- Enable forecasting of equipment needs for any new products or schedules
- Reduce overall stock of equipment
- Integrate all of the above information in order to deliver equipment 'just–in–time', monitor performance, identify problem areas and help to eliminate them

The Continental Master Food Schedule (CMFS) identifies the provisioning codes for each flight, approximately 4 weeks before the flights are due. These codes can be sub–divided into regional categories, such as domestic, international, and intercontinental, as well as aircraft type in order to establish the specific equipment requirements and tray set ups. The type and quantity of equipment is essentially made up of three types **:**

- Equipment need to respond to the forecast passenger numbers on this aircraft type and route (i.e. pax related provisioning codes)
- Specific bulk equipment need for that aircraft type or route (non PAX related provisioning codes)
- Core galley equipment by aircraft type and route (bulk loaded equipment)

This information was then processed by the 'analyser equipment forecasting routines' in order to develop a network analysis of the flow of items in and out of any selected catering station. In order to achieve this, each type of equipment was defined as disposable or rotable, and given a sector life (by definition disposable items have a sector life of 1, i.e. they are used once and thrown away). For instance, in this system the sector life of a trolley was designated as 200. Hence this part of the system enables Continental to calculate for any given day what equipment should be held at any station (stock held = equipment coming in plus any par stock, less equipment at end of sector life and equipment going out).

3.15 FURTHER READING :

1. Parvinder S. Bali, Food Production Operations, Oxford Publication
2. Krishna Arora, Theory of Cockery, Frank Bros
3. Thangam E. Philip, Modern Cookery : Vol. 1, Orient BlackSwan

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UNIT 04

Meal Production & Packing

UNIT STRUCTURE

4.0 LEARNING OBJECTIVES :

After studying this unit, you will be able to :

- Analyse packaging to learn the main purposes of packaging
- Convenient cooking

- Indian snacks
- Understanding salads, soup,
- Understanding waste generation and its management in airline catering

4.1 INTRODUCTION :

Generally Airline kitchens are located near airports so that timely delivery can be done. Depending on the number of flights being served the size of kitchens may vary. After finishing of production it is required to transport to airlines so that it can be served to on–board passengers. However it is also transported at terminal for passengers waiting for their flights. Whatever it may be either to the flight or terminals, food need to packed to avoid both physical as well as bacteriological accidents. Packaging is done for all foods and beverages either in bulk packaging or portioned packaging. In consumer interest it is important to focus safety, quality and nutritive of food. Therefore Food Packaging focuses on physical and microbial effects on processed food that is to be either stored or deliver. Food that is to be stored may portioned during packaging then only it is sending to delivered. For food or beverage that require instant processing before consume are packaged in big container/trays and the flight attendant process it on board before serving it. Packaging of in–flight meals needs to be smooth and continuous process. As a stiff competition in global market products with increasing consumer demand have to be attractive packaged along with following safety measures to avoid any chance of cross–contamination. Therefore it becomes vital for companies to find and use sustainable packaging materials, implementing flexible and standardized technology, and proven management principles to improve productivity as well. Production units need to adopt recent developments and improvements packaging.

4.2 PURPOSES OF PACKAGING :

Packaging is a method to protect and contain foods with less or without impact of environmental constraints and keep it fit for our consumption. Protection, convenience, presentation, preservation, portion control and utilisation are main objective of packaging.

Protection : The primary purpose of packaging is to protect food or beverage from any sort damage (physical or microbiological) that could happen during transportation, handling or storage. It is important to retain the food intact throughout its logistics chain from kitchen to passenger. Packaging protects from moisture, heat, foreign materials, and other external factors. It is also need to ensure that no odour, alteration of taste after preparation due to any reason should occur.

Convenience : Packaging also provides ease of transportation and other aspects of handlings. It is also simplifies serving and eating. Packages also have feature to add convenience to keep the products that is to be delivered together and chances spill can also be reduced. For example products like juices, sauces and sausages etc. packaged in such a way so that consumer can consume it easily at the same time sealed package also prevent spillage and loss. Some food packaging is done in such way that consumer do not require extra crockery and cutlery to consume it. For example wraps or pizza what we ordered at home, it comes with box that we need to just open and consume it.

Presentation : Attractiveness of packet in which food or beverage is kept, enhances the acceptability of it. As we know food is not only consume by teeth but also by eyes and nose as well. A unique packaging can increase the attractiveness of food and passenger willingness to consume it with more delight.

In flight industry food are packaged for these three reasons mainly. However, it also Prevent from theft or misuse by crew member. As the production unit need to supply as per the PAX (abbreviation for number of person, used in hospitality and tourism industry) of airlines or in number how many has been asked by airline. It also enable them to deliver to loading staff in stimulated number by this chance of mismatch the order and delivery requirements. All the deliveries are well recorded and cross checked against each order so there is less chances of misuse also. Shelf life of food can also be increased by packaging, so it has function of preservation too. Since proper packaging method stopped the life processes and microbial growths, that make food safe for consumption as well as longer shelf life. Each similar food package has definite quantity, which enables both cost control as well as avoids chance of customer dissatisfaction. At the same time consumer feel consistency in every delivery (if repeats the order). Therefore consumer has convenience to order desired quantity.

4.3 FOOD PACKAGING TYPES :

Food packaging serves many purposes, from protecting the food to creating portion sizes to vital required information on the product itself. An old prove said "necessity is mother of inventions", with the increase in need the packaging materials are developing day by day. There are different types of packaging available in the market.

Aseptic Processing : Items such as milk and milk product drinks required to sterile and are to be maintained sterile. These foods are processed and can be preserved for longer periods of time. Aseptic packages are made of a mixture of paper, polyethylene, and aluminium and contain a tight inside layer of polyethylene.

Bag and Wrappers : It is a common form of food packaging we can see it in our daily life in the form of bagged snacks like Wafer, Nachos, Candy, Chips, Pretzels, Khakhra, Thepla, Biscuits, Khari, Bhujia, Namkeen, Popcorns, Chocolate bar and so on. Wrappers are used for packing items individually. Bagging prevents food from the air and hands contacts and it remains crisp or how it should be before consumed. During packaging in bags vaccum packaging, modified atmosphere packaging etc. techniques are used.

Boxes : Foods such as salads, sweets, pastry, gateaux, cheese, cereals, and snack crackers are packaged in boxes and can be serve directly without further processing or crockery requirement. It is most convenient during transportation of food. Commonly it is made up of materials like hard paper, metal, corrugated fibre–board, or wood.

Cans : cans are used as replacement of glasses. Beverages such as Milk, Lassi, Chhas, Juices or aerated drinks can be both stored, served and consume with cans directly. It is also used as way of preserving and transporting foods. Mostly cans are made of steel, other thin metal or having a thick lining on food contact area, are durable and easy to be crushed in dustbins.

4.4 PROCESS OF PACKAGING FOODS :

Meals are usually prepared on the ground in catering unit which is close to the airport, and prepared foods need to be then transported to the aircraft. Now these foods are kept in refrigerated environment for flight attendants to heat and serve on board. Selection of material and method for packing food at production unit is not done on daily basis. Once decided what material and method to be used for packaging food to be delivered on–board. The purchase order is send from purchasing department and stocks the packaging materials in the stores on the basis of forecasting by various departments who are going to use it. At production unit when food is ready to pack the first step is organising the packaging space and materials to be packed. At the same time it is also keep into consideration of movement of package to trolley and moving to loading areas.

Measure : the first step of any packaging is measurement or counting of food per portion to be served. Before purchasing packaging box/can/sachets etc. the dimension of final food already considered, therefore at this stage the quantity of food is ensured as it must me same in similar packets. In–case of wrap the size is decided in such way so that food is wrapped completely as well as convenience to eat also.

Filling : Filling is done by filling equipment, these equipment provide ease in filling as well as also help in portioning. Now days the filling line are set up with automatic system that serves both the purposes along with time savings.

Sealing : After filling done it is need to be sealed to prevent to spill during further process of delivery. The sealing machines make sure the film seal on the trays is strong enough to withstand the internal pressure during the cooking and packaging processes as well as when reheating and also remains easy for consumers to peel away while going to eat.

Cooling : Now the foods need to be rapid chilling so that it will be further proceed for transportation. Cooling equipment such as blast freezer, cold room refrigerator, hose–chiller, etc. are used for chilling. Controlled cooling ensures quality and prevents microbial growth.

Tray and trolley assembly : Now these foods are packed into trays simultaneously into appropriate trolleys and containers as per flight requirements. chilled meals, trays, drinks, tableware, linen, toiletries, newspapers, magazines, children's games, duty–free/sales items, baby food, first aid kits, accessories (slippers, blindfolds, headsets), toiletries, pillows, blankets, face towels, napkins, and printed menu cards are placed into individual trolleys so that one trolley is equipped and it can be to assign to respected flight attendants.

For assembling these foods onto trays, it is collected from different sections or type of kitchen. The different varieties of foods from chilled storage, special meals and cold dishes, bakery, equipment store, and cutlery wrap area. The ideal approach to loading these items is to place as much as possible onto the tray that will eventually be presented to the passenger on the aircraft. The hot main course meal is placed at the bottom of the tray, with the cutlery pack. Adjacent to these foods the starter or cheese and biscuits are kept. Then sweet dishes and bread roll is kept across the top of the tray with cup is placed. Tray assembly also carried out on line assembly or in batches. In line assembly, the empty trays are arranged in such way that when it moves along a conveyor belt, workers assigned with different items put it trays, these tray once equipped with required items then is

placed in a trolley. In this type of assembly, trays are filled with similar or common foods at a time. While, in batch assembly, a single tray is assemble with required items onto trays and puts these into a trolley. This strategy is also called 'make and pack'. The line assembly requires the coordination of different workers (number of workers depends on number of items to be placed in a tray), this tends is ideal when large number of trays need to be assembled. For efficiency of this system depend on balanced flow, that means, all assembly workers require same time per tray to complete, because the conveyor can move at the speed of the slowest worker. However flight caterers are moving towards automation in assembly operations, that saves time.

4.5 CONVENIENT COOKING :

The practice of organising the recipes in such way that it makes preparation simple and quick is called convenient cooking. This trend has been developed due to time constraints among working people. Now days it is a common practice because both member of family (husband and wife) working outside elaborate meals are difficult for consume. It is also because bachelor life style or stay alone in home, convenience foods become more popular. It is most popular among working class people, teenage, hostellers, bachelors, sharing rooms etc. People become so habituated of these foods; they demand it during flights so it is therefore included in on–board menu also. These foods are typically a complete meal and have been pre–prepared commercially and so require minimum further preparation.

Therefore it is easy for flights to serve it. There are both types of food i.e. foods that are serving hot another are that are consume cold. Convenience food comes as canned, dehydrated and frozen. Vegetables, stews, meat, etc. comes in can and need to reheat before consuming it whereas sardines, fruit, etc. are consume as it is. Dry fish, dry meat, spaghetti etc. are dehydrated foods and require further process but doesn't require more time to make it to serve.

Convenience Foods are common now days in catering industry since it is cost efficient and saves time in delivery and no need to focus on portion control too. No specialised labour is required for its processing which also saves cost on labour as well consistency remains. The use of convenience food is not limited to ready to eat foods only but in kitchen it provide a great help in saving energy of the chefs, as well they have wide range of choice to prepare cost effective

products. For example basic stocks and sauces are available in dehydrated forms which saves both time as well as if any mistake in preparing these ingredient for food by using age old methods which are time and energy (fuel like LPG or electricity) consuming method can be avoided.

4.5.1 Types of Convenience Foods :

Shelf–life of foods extended with the advancements in food technology and packaging methods and materials. Not it is easy to transport as well as consume with less or without efforts in cooking. Selection of packaging these foods depends on characteristics, types, composition, moisture, fat, protein, flavour, shape (regular, irregular, with sharp edges etc.), crispiness, etc. Convenience foods can be classified into three groups.

4.5.1.1 Ready to Eat Foods (RTE) :

The foods that can be directly consumed from the package with or without warming, thawing and without preparation are called Ready to eat foods. Foods that have been prepared so they can be consumed as is, without any additional cooking requirement. It can be refrigerated and are shelf–stable so require just heating for served hot. The manufacture ensures specific guidelines during manufacturing and delivery with ensure that there is no contamination or chance of bacteria forming after the preparation or consumption. This include bread, pastry, puff pastry, chips, crackers, cheese, cereals, Ice–cream, canned items such as tuna fish, tomato sauce, ketchup, mayonnaise, nut mixes and candy etc. it can be summarised as snacks, sweets, baked goods, Retort processed foods, Frozen foods, and Adjuncts.

Bakery snacks and fried snacks : Baked samosas, Cheese, chips, wafers, fried legumes and other snacks cheese spread, butter Biscuits, bread and ghee etc. both bakery snacks and fried snacks are consumed throughout the globe in either way or name.

Sweets and Deserts : Gulab jamuns, kala jamun, Rasgullas, pedhas burfis, sohan papdi, sohan halwa, Mysore paks, besan laddu and other sweets, muffins and cakes etc are comes in can and packets.

Extruded snacks : The productions of snacks which are mainly produced from cereal flour or starches are called Extruded snacks because it is processed by Extrusion cooking. These snacks are normally high in calories and fat with low content of protein, fibre, and considered as unhealthy by consumers. These snacks include Cereal based, pulse based, or soya based. Cereals, cereal chips, croutons and crackers etc. are ready to it foods.

Adjuncts foods : Pickles, dry chutneys, fruit chutneys etc. are accompanies of main meals and do not require any processing.

4.5.1.2 Ready to use Foods (RTU) :

The Foods requires little preparation like cooking, frying, heating, or just a touch–up before consuming it, are ready to use foods. Instant idli, noodles, dosa and rava idli, mixes are ready to cook (do not require to add much ingredient or cooking). Their initial moisture content classified it as high moisture, low moisture as well as medium moisture food. Freshly cooked foods like bread and cake have higher Equilibrium Relative Humidity (ERH) so the products breathes out the moisture and it is needed to allow escape of these excess water vapour from the closed package. After condensation the chances of spoiling, degradation of quality, and it may leads to microbial growth.

High Moisture Food : is having great moisture up to 20 to 60% since they have up to 85% of ERH. Foods like bread, cake, chapatti, pickles, sauces etc. do not allow moistures to come out.

Medium Moisture Food : they have ERH up to 65% and contain moisture of up to 6 to 20%. Paneer Pakoda, Dhokla, Samosa, Vada Pav, sweetmeats etc. are medium moisture foods.

Low Moisture Food : it has less moisture up to 1 to 5% since having low Equilibrium Relative Humidity of 18–20%. Hence they have the tendency to absorb moisture from the outside environment and become soggy, and lose crispiness, brittleness as well taste.

Beside convenience, Ready to Cook foods also save time and efforts. However in–terms of vegetables it is never prefer to be used as frozen, but some consumers unwillingly or willingly consuming it. Carrots, beans, cabbages and others vegetables are washed and cut into slices, cubes and shreds and modified atmosphere packed (MAP). It is raw and packaged so need to be careful while cooking it. Cookie dough and pizza base are excellent example of it. Masalas like garam masala, chat masala, meat masala, rasam powder, sambar powder, ginger and garlic paste are also ready to cook food that are used in cooking. Ready to fry foods (RTF) like papads, fish fingers, kebabs, chips, fryums and chicken are just fry before consuming it. Some foods like khoa powder, kulfi and ice–cream mix, instant ice cream mix are intended to reconstitute it.

4.5.1.3 Frozen Convenience Food :

Frozen foods Tikkas, Kebabas, ice cream, Idli, meats, fruits and vegetables are also ready to eat which are kept frozen due it is short shelf life. Modern trends and technological advancement allows and avail both products that can be heated in a microwave oven or a conventional oven. Shelf stable foods are best suited for microwave heating. Due to advancement in packaging foods are packed in materials that are not suitable for heating in ovens like paperboard, thermoset plastics and thermoplastics so it need to remove from original package and then reheated in some other container. Among these thermoplastics can be heated in convection oven under control situation. Frozen foods have a property to store

in low temperature over a long period. These items are either frozen ready–to–cook foods, or ready to eat like fruits, frozen vegetables, sausages, salami, or other meat & poultry products, seafood, frozen pizza crust, bread, frozen dough, and readymade soups.

Airline catering industry is continuous effort to give It is easily and conveniently available, since advancement in technology as well as rise in production units we can get at many place. Frozen foods can be a convenient and affordable way to incorporate healthful foods from every food group, including whole grains, fruits, vegetables, protein and dairy. In addition to a time–saving convenience, frozen foods can be a benefit for individuals with limited kitchen space or utensils. It's not only about affordability, but they also can also help in food waste reduction. Airlines very wisely select and contracted with suitable production units or its suppliers. As these foods save chef's time as well as maintain passenger's taste acceptability.

Retort foods : Foods such as curries, parathas, palak paneer, dal fry, curry rice, upma etc. are filled into a pouch or metal can, sealed, and then heated to extremely high temperatures. Retort pouch is a special package in which the perishable food items are preserved by various means. It remains undamaged while thermal processing, and flexible as well.

4.5.1.4 Beverages :

Ready to drink beverages (RTD) : Like ready to eat food, ready to drinks are beverages that are directly consumed from container like fruit juices (apple, mango, guava, straw berry etc.), aerated beverages and milk based beverages (Lassi, butter milk, peanut milk, ayran, chal, chalap, kumis, and soybean milk etc.) are widely available in market. It is very much popular among all the age groups. Airline caterers know it very well and provide it in menu.

Ready to serve beverages (RTS) : Another variation in easy drink is some beverages need some preparation before serving. Like squash, crush, iced tea, instant juice powders, instant soup powders, cordial, chocolate based drinks, syrup etc. need to be diluted or modified before use.

4.6 INDIAN SNACKS FOODS :

Traditional food products are socially, culturally, and economically important. Indian regional snacks are now, so spread and widely available and consumed across the globe not only at home but also serve as street foods, in restaurants, malls, railways platforms and so on. The airline caterers due to passengers love towards these foods, now serving on board. These practices have been observed by food manufacturers and they have taken as an opportunity and manufacturers like Balaji Wafers, Bikanervala, Haldirams,Yellow Diamond etc. are Indian brands leading Indian market with several variations like multinational companies Pepsico and so on. Beside ready to eat snacks ready to cook foods like : Seekh kebab, Galawati kebab, Aloo tiki etc. are available in market, airline caterers also focussed on these items to include in their on–board menus. This not only enhances the dining experience but also target the passengers emotionally. Bhel poori (beach snacks especially from Juhu beach Mumbai, although equally liked in various parts of country with variations), Mathri (widely consumed by north Indians), Jhalmuri (Bengali street snack), Kachori, vada pav (Mumbai style sandwich, with chutneys and green chilli pepper as spread and filled with deep–fried potato dumpling placed inside a bread bun called pav) etc. when serve in

flight to Indians as a snacks instead of cookies, it not only satisfies the taste but emotional attachments also developed. So it is a challenge and necessary for manufacturer to ensure food safety and nutritional aspects. It is therefore essential to have knowledge of their production process. The small–scale food processors have already taken advantage of it and supplying in local market. Wealth of knowledge on traditional products needs to be further expanded in collaboration with local people and these small scale producers.

India is one of the oldest civilizations in the world with a dynamic and rich cultural heritage. It has 28 states and 8 union territories having so many regional cultures. Since independence it is developing in socio–economic and culture and traditions remain integral among Indians. As having 2nd largest populations with different ethnic groups the country is unique in its own way. Because of having different geographical features (The Himalayan Mountains, The Northern Plains, Desert, Peninsular Plateau, Coastal Plains and Islands) impact variations in its culture and food and food culture. India is of the largest multi cultured religiously and ethnically diverse country. It doesn't have any one culture or one language, dress–up, cuisine and their social and religious pursuits. Indian cuisine varies from region to region and different regions have their own unique dishes, which are prepared during religious and social gatherings.

Globalisation has played an important role in cross culture practices that led to many food items from other countries being prepared or sold in Indian markets as snacks as well as traditional snacks of India is available and consumed by other countries too. Gujarati people are found of Farsans they also carry it along with them during any journey. For instance namkeens from Bikaner is also popular among other parts of globe. Indian snacks are prepared with variety of toasted, fried or baked ingredients such as dal, potatoes, besan etc. Indian foods are not restricted to vegetarian foods/snacks only but without onion–garlic snacks (Sev, Gathiya, Fafra and so on) can also be found at the same time meat based snacks such as Kebab, Keema–samosa, Macher Chop (Bengali Style Fish Croquettes), Chicken Shikampuri Kebab (Hyderabad), Jeera–Miri Kolambi (Maharastra), Bheja Fry (South India and Mumbai), Meen Varuthathu (Kerala Style Fish Fry) and so on, it is countless as we are found of foods. This love towards Indian snacks among various age–groups and class people enables airlines to avail these items at airport terminals as well as on–board. These snacks have their own accompaniments. However Hari chutney (like : Pudina chutney, dhaniya chutney, pudina–dhaniya chutney and many more), Lal chutney (tamrind chutney, tomato chutney, lehsun ki chutney, lal mirch ki chutney and many more) are famous with Samosa, Bhajia, Dabeli (Kutchi style burger) and other snacks. Not only taste but nutritional value of these foods also attracts flight caterers to avail this. However pungency of these foods may constraint to serve these foods to European passengers. Upma, Dhokla, Cheela (savoury pancake made up of gram flour) etc. are also options who prefer to have less spicy or pungent foods. Snacks prepared from dairy products such as Paneer (cottage cheese) and Dahi (yogurt) are also popular. Dahi kebab is prepared from hang curd, whereas paneer tikka, chily paneer (variation of chilly chicken) etc. are also liked by people. Besides chutney, Aachar (pickle), and Raita are excellent accompaniments for Indian foods. The methods of cooking for these snacks Aloo tikki, kachori, papdi, salted Peanuts, roasted Cashews, Jhaal muri, Fafda, methi khakra, Khaman, Dhokla, patra, Khandvi, Gathiya, patra, Murukku, Banana chips etc. also vary from frying, steaming, roasting, sautéing, griddling etc.

4.7 SAUCES AND ITS DERIVATIVES :

In Kitchen sauces are the ones usually prepared by the Chefs for the preparation and completion of various dishes. The skill, abilities and experience determines quality, taste, appearance of sauces. These sauces are basically used for taste, textures, moisture, flavour and appearance of the foods. These sauces can be classified as mother sauces, proprietary sauce and derivative sauces. These sauces may be served as Hot, Warm or Cold.

4.7.1 Mother Sauces :

Also known as basic sauces because by making the base of these sauces various other sauces. There are six basic mother sauces as per French cuisine : Velouté, Béchamel (White Sauce), Espagnole (Brown Sauce), Hollandaise (Dutch Sauce).

Beside these four Mayonnaise and Tomato sauces are included in it, however some chef include one of these two into mother sauce and count it as five. Whatever belief of chef but all together we have six basic sauces uses in kitchen.

4.7.2 Proprietary Sauces :

Proprietary sauces are sauces which are commercially prepared and available in market, these cannot be prepared in kitchen. These sauces are normally used as served as a part of accompaniments to dishes. Ketchup, chilli sauce, Tabasco Sauce, Worcestershire sauce, HP sauce etc. is most common among them. These sauces are also used in the kitchen as marinades.

4.7.3 Derivative Sauces :

Derivative Sauces are derived or variations and creations of new sauces by making base of mother sauces. These are frequently made in kitchen to accompanying the dishes. For example Tartare Sauce is served with fried fish preparations whereas Thousand Island sauce is used as both accompaniment as well used in preparation of dishes (both are derivatives of Mayonnaise Sauce).

Caramel Sauce, Chocolate Sauce or fudge sauce, Coulis etc. are drizzled or poured on desserts as decoration it also adds flavour, moisture, texture and colour to the dessert. These sauces may be cooked or uncooked.

4.8 SANDWICH :

The sandwich is all time favourite and convenient food. It is eaten in breakfast, lunch, and high tea as well. It is hot as well as cold, for instance grilled sandwiches such as cheese grilled sandwich and Philly Cheese Sandwiches chicken Caesar wraps need to serve and eat hot, while cold sandwiches like Chicken Waldorf sandwich, Caprese Sandwich or Muffuletta Sandwich etc. need to be serve cold. Some salad based sandwich like Coleslaw sandwich and Shrimp Salad Sandwich are also served cold and people like to have this. Sandwiches do not require much time to ready for servings and accepted by almost majority of people, so, it is convenient to serve to on board passengers too. It is also easy to make adaptable or expected variations and can satisfy nearly every taste and nutrition requirement. Less preparation time requirements and more readily acceptable among passengers, airline caterers focused it to include in in–flight menu as well as avail it on airports terminals.

If we go by definition then "A sandwich is dishes prepared with vegetable, eggs, fish, or meat or all combine together, placed on or between slices of bread with spreads like Mayonnaise. A slice or grated cheese such Mozzarella, Cheddar etc. can enhance its taste and appearance" or simply we can say "A dish wherein bread act as a container or wrapper for other ingredients like meats, vegetables etc. is Sandwich". Sandwiches are made up with various types of bread this impacts dramatically effect on the finished goods. Therefore the quality of the bread also has a great significance on the quality and taste of sandwich. Another element in sandwich quality is spread. Butter, tomato based sauces, mustard onion, garlic and mayonnaise are used as spread. The main function of spread in a sandwich is to act as moisture barrier between bread and the filling, Flavour and taste enhancer, prevent from dryness in mouth. Therefore good spread should be soft as well as rich and moist. Third element called filling, it may include smoked salmon, prawns, lobster, roast lamb, salami, roast chicken, duck, turkey, eggs as well as dry & creamed cheeses. The main purposes of the fillings are to provide : flavour, Moisture, act as main body and the nutrients. The last element garnish like lettuce, tomato, watercress, spring onions, radishes, gherkins, cucumber and parsley not only gives appearance and palatability but also provides nutrition in addition. Indian variation of sandwiches includes Paneer (unsalted Cottage cheese).

4.9 SOUP :

Airline caterers also know the time constraints of passengers so they include the liquid food which is easy to serve and easy to consume. Soup can be starter or a complete meal. The nutritional value, taste and flavours of soup attract consumers to choose it as their food. This replenishing aromatized and a complete meal liquid is obtained from meat, poultry, fish, and/or vegetables. It may be clear like broths and consommés or thick like cream soups, may be serve hot like bisques and chowders as well as cold soups such as Gazpacho. Stock is main ingredients of any soup however in some cases water gives better taste than stock. In another words we can say water is better replacement for many stocks in most soups and stews.

With the advancements in food science technology, soups have become portable. Manufacturer processed it into can, sachets and cups, which requires adding hot water and mixing well with the help of spoon and consumed directly.

It is said that "Pocket soup" was carried by colonial travellers, as it could easily be reconstituted with a little hot water. Canned and dehydrated soups have been supplied to the military, in trains, and even it can be find at local grocery stores since 19th century. Specific dietary needs such as low salt, high fibre, etc. can be achieved due to advancement in food science that enables manufacturer to adjust nutritional requirements. It can be said that the popularity of soup is increasing day by day among kids, young as well as old people with nutrition consciousness and desire for simpler lighter meals. Reason what so be but the soup is available easily and widely acceptable. By keeping in mind these factors airlines caterer has to do soup selection very carefully. As they can provide both readymade soups or prepare themselves in their kitchen on ground. However portable soups are more convenient way to serve on–board. Some famous soups across the globes are : Gazpacho (Spain), Minestrone (Italy), Green turtle soup (England) French onion soup (French), Manhattan–clam–chowder (USA), Camano (Brazil), Paprika (Hungary), Clam chowder (New England) and so on. Beside these classic soups there are so many variation in these soup and soup like Tomato soup, puree soup as per the choice of passenger are available in portable form as well as prepared in flight kitchens.

Accompaniments and Garnish for Soup : Accompaniments are small food serve along with main foods and it depends of base of the stock from which soup is derived. In the case of soup the common accompaniments includes Breadsticks, croutons, crackers etc. to contrast and balance nutrients. In addition cheese, toast, Cheese straws, Corn chips, Whole–grain wafers, Profiteroles etc. can also be eaten with soup. Small chunks of crisped bread or fried noodles are also used as garnish in the soup, or herbed bread sticks, which can be dipped makes soups more interesting.

Although soups have their traditional accompaniments but cooks improvise it as per requirements. Traditional accompaniments include croutons, pasta, noodles, hard–boiled eggs, dumplings, rice, potatoes, sausage, pulpety, and so on. Diced fried bread croûtons and sliced bread sippets are served as an accompaniment with purées. Vegetable garnishes are added to clear, cream, velouté, brown and some roux–based soups. The purpose of accompaniment is to enhance the flavour and presentation of soups as so done by garnish. Garnishes are also edible and appetising and provide colour, texture and flavour to soup. Garnish Depend on the type of soup to be served it can simple and exotic. Soup garnishes may be divided into Garnishes, Toppings and Accompaniments.

In some soup such as vegetable clear soup, vegetables itself considered as garnishes. This may also include seafood, pasta, meats, and poultry etc. therefore are treated as part of the preparation or recipe itself. Every soups does not require toppings like clear soups are served generally without toppings or very small toping like cilantro leaf, chopped parsley, Sage leaves or chives etc. so that the attractiveness of the clear broth should not be disturbed and the cut vegetables allow to speak for themselves. Thick soups, especially those are having single colour are often decorated with a topping and placed just before service so that fresh appearance can be maintained. Thick soups are decorated with fresh herbs, croutons, fine julienne of vegetables, grated cheese, sliced dry fruits such as Cashew and almonds, toasted crumbled bacon, grated cheese, sieved egg yolks, flavoured butter or whipped cream.

In case of packaged soups the garnish are present inside the package in dehydrated form. It is less preferred by some consumer due to amount of

preservatives used may high in order to enhance shelf life of soup. However these preservatives may cause health hazards in addition soup may lose its nutrients when they come in contact with heat, as they are dehydrated after preparing it. In fact there is some unavoidable loss in any food preparation, particularly in cooking. However vegetables soup still are good source of nutrients, if prepared properly.

4.10 SALAD :

Salad is a mixture of fresh and crunchy foods. It is known by names different in different countries for example in India it is written as Salad but pronunciation you know very well, any way in French term as Salade, Germany (Salat), Italy (Insalata), Portuguese (Salada), and in Spain (Ensalada). It can be vegetarian and non–vegetarian, or simple and compound, or can be fruit or lentil based or sprouts. It is healthy choice for keep healthy. Vegetarian salads as name suggests are prepared completely with vegetables and/or fruits, whereas non vegetarian salads have body of shellfish, meat, fish, or eggs. Beside main ingredients other ingredients such dressing, nuts or croutons, pasta, cheese, or whole grains are included while preparing salads. It can be served as an appetizer or some people take is as whole meal. The quality of salad is determined by crispiness, piquant, colour, seasoning and attractiveness. It is considered as good supply of nutrients. Fresh fruits and vegetables salads are strictly made with fresh ingredients with little other ingredients or dressings.

Generally the ingredients used in preparation are highly perishable so the chances of contamination increased. Cold salads such as Coleslaw (Dutch), Waldorf salad (USA), Potato salad (Germany) etc. are dressed with mayonnaise where as some salads like Caesar salad (Maxico) have lemon juice, olive oil and some other ingredient with dressing. Sometimes the ingredient is itself a garnish too. As we can say the salads have basically four parts; the base, body, garnish and dressing.

Base or bed of salad includes leafy vegetables such as lettuce also called salad leaves, watercress, baby spinach, cabbage etc. whereas tossed salad do not have underline, they are served in bowl. Body is the most important part of salad. The name of salad is known generally by its ingredients used for the body. The third part of salad is garnish; it gives appearance as well as improves the taste and form. The final part is called dressing and adds flavour, helps in digestion, and can improve palatability and appearance.

4.11 FOOD WASTE IN AIRLINES :

Waste is a potential source of cross–contamination as it contains foods, peels, wraps, foils, and so on, these can be hazardous if not treated or dispose–off properly. Unorganised management of these items from kitchen, galley, and from cabins may leads to serious issues. To avoid adverse health consequences disposal of these wastes are very important. If it is not being managed in a safe manner, passenger and crew may expose directly on airline as well as at airport terminus as well as through air and have to face health issues.

The term Food waste is used for foods those have completed the process and delivered to the flight, and is fit for consumption, but not consumed because of any reason and need to be discarded. It is secondary issue whether or not it is left to spoil or expire. We should keep in mind that when food is wasted, other resources that involved in its production and processing is also wasted. Intentionally or unintentionally wastage is not of use, improper use of food should also be considered as wastage.

Food waste management has always been an area of focus for catering organisations whether it is airlines, hotel, restaurant or any other catering unit. Food waste management is considered as a core issue within catering facilities; however we should also keep in mind that whenever and wherever food is handled it can produced waste. Even proper disposal of these leftovers isn't end solution, as decomposing food in landfill produces methane that causes environmental imbalance.

Causes of food waste : Food wastes mainly occurs at the production stage due to lack of skills, poor infrastructure, improper storage facility, natural calamities, and poor practices at production unit, however it is also consider while shaping a raw material for garnish and presentation purpose. Foods also get wastage if consumers intentionally discarded it. Improper planning or execution during storage also leads to spoilage. Sometimes due to improper planning in storage either over demanded or improper circulation, foods gets over of its expiry date and now it is of no use. At times, food waste can also happen due to oversupply in markets. If the food doesn't conform to the expected quality standards it may become wastage. A study shows that in economically developed countries, consumers are responsible for the majority of food wastage.

Wastage by kitchen and gallery : In inefficient processing of foods in kitchen results to wastes in terms of spillage, spoilage, discarding of inferior edibles, or removing edible food parts to give a shape and equalising cuts. Galley kitchens are assembled on board in order to provide convenience to crew for serving food on boards, during processing waste emanates and need to be cared.

The foods need to process well in advance in order to avoid last minute hustle. On the basis of previous experience and passenger traffic, expected numbers meals and menu are calculated in advance and planed the further process accordingly. However the preparation and process gives priority to first–class customers in terms of number of meals too, this priority leads to a proportion of these class meals may remain uneaten.

Not only food waste but significant amounts of waste of paper, aluminium foil, glass, and various types of packaging materials too. In case of actual traffic differ from expected passenger traffic; the remaining packets may go as wastage. Therefore due to over–preparation food gets wastages. Production units have to

be fixed with its portion size too however some consumer may eat less or more than that in both cases food remain in the packet (as the person who require more than the portion may need to order for another packet).

Wastage by passengers : every passenger who ordered food does not accept all the ingredients used in preparation of dish. Since food is pre–prepared before flying so there is no option for crew as well passenger to remove the item from the dish which doesn't accepted by the consumer. Habitual, normative, intentional and situational measures can be said as main reasons of food wastage by passengers. How a passenger is dealing with left food whether he/she return it to crew member or just keep it in tray after improperly eating it. Some passengers are habituate to waste or over ordering. Perception, taste, consistency, portion etc. also impact on acceptance of food and food may left–over if it does not satisfy the parameter to consumers. Situational Measures may include health condition, Food allergy, preference and timing.

4.11.1 Waste–handling systems :

Wastes generated in different sections of flight catering are collected from its origins and carried to the waste area and segregated as per type of waste. The techniques of carrying these wastes to waste–holding area are bins, conveyors and so on. For smooth and hustle free operations large–volume wheeled bins are appropriate as it provides convenience to carry along. Various systems are available from a number of manufacturers. Conveyors are easy–to–clean belt running on lines rollers which are dip and lengthy. Due to this the wastes do not spill out and carried to the wastage holding areas. Since it can be cleaned easily and continuously both the belt baths and scrapers. It is cost–effective for large operations and operates automatically.

4.12 CROCKERY AND CUTLERIES :

In dishwashing sections Crockery and cutleries are picked by hands from the trays, then scraps such as food, paper, bottles, etc. are removed by the torrent of water. The water passes through a rotating screen drum at the waste extraction area the drum filters out solid wastes and deposits them in a skip. Liquid effluent is drained in sewage system and the solid wastes are thrown into dustbins.

All collected and segregated wastes are disposed of by general waste–disposal methods traditionally used by flight caterers are incineration, landfill and water treatment.

❑ **Check Your Progress :**

1. Convenience Foods are common now days in catering industry since it is :
   (a) Cost efficient (b) Time efficient
   (c) Portion controlled (d) All of the above options
2. Filling of sandwiches may include _____.
   (a) Prawns (b) Salami
   (c) Smoked salmon (d) All of the above options
3. The main function of spread in sandwich is to _____.
   (a) Enhance taste (b) Act as moisture
   (c) Act as filling (d) All of the above options
4. Which of the following is not a cheese
   (a) Mozzarella (b) Mayonnaise (c) Paneer (d) Cheddar
5. Gazpacho and Minestrone is a kind of _____.
   (a) Soup (b) Sandwich
   (c) Both (a) and (b) options (d) None of the above option
6. Which of the following is not used as accompaniment of soup ?
   (a) Breadsticks (b) Croutons
   (c) Whipped cream (d) Sausage
7. Salad is called Ensalada in which language ?
   (a) Spanish (b) Italian (c) Protuguese (d) German
8. When are the salads served ?
   (a) Before a meal (b) With a meal
   (c) As a meal in itself (d) All of above
9. Cause of food waste are :
   (a) Poor skill of chef (b) Lack of infrastructure
   (c) Both (a) and (b) options (d) None of the above option

4.13 LET US SUM UP :

Airline catering industry provides a massive amount of processed foods over a billion passengers every year. Before catering to such a huge scale, they have to engage with various tasks and sourcing, preparing, and delivering hundreds of meals for every flight. As a caterer of airlines your products have to be attractive and attention grabbing to them. You have to come up with types of food separately; each foods having its own shelf life, protection requirements, and regulations that need to be follow for safe delivery. For quality food delivery, Airlines also associated with celebrity chefs who can create special menus for those in business or first class. These tend to focus on food that tastes good while flying. At the same time food waste from these catering has become a complex phenomenon.

Food once get prepared need to pack it up to supply on–board. Product packaging in the food industry is unique because it must allow the contents inside to stay fresh and safe for consumption, even after long hours of shipment and distribution. Because of this, certain products will require specific types of

packaging materials that protect them against temperature, manhandling, etc. Frozen food, dry grocery items, and perishables each need a different type of packaging to maintain freshness. It is also important to choose a packaging material that will withstand contamination.

Convenience foods include ready to eat and ready to cook meals, comes as canned, bottled and frozen foods, dried foods such as packet soups and sauces, cake mixes, or instant desserts.

India is a country known for unique blend of spices in food along with varying textures, taste, richness, body and flavours. Indian snacks got popularities in last few decades.

The sandwich is a favourite meal for every age group. It is nutritious and less time consuming in terms of preparation, serving and eating. It has many convenient and adaptable variations. Sandwiches have long been the domain of the pantry department, along with salads and other cold dishes.

Flight catering also produces an enormous amount of waste, reusable crockery and cutlery from uneaten food, and the packaging materials. Waste is also produced by kitchen processes in airport service operations.

4.14 ANSWERS FOR CHECK YOUR PROGRESS :

1. (d), 2. (d), 3. (d), 4. (b), 5. (a)
6. (b), 7. (a), 8. (d), 9. (c)

4.15 GLOSSARY :

Bheja Fry : a non–vegetarian street food popular dish of South India and Mumbai, the goat brain is fried with coated bread crumbs inspired from Cuban but marinated in Indian spices.

Body of Salad : The main ingredient use in preparing salad.

Cassolette : The term refers to the container that holds the hot or cold meal that is to be served on a tray. The cassolette can be made of aluminium, melamine or porcelain.

Cockpit crew : captain, first officer and flight engineer.

Crimp : To cover with a hermetically sealed lid that is pinched down onto the sides of the container.

Crockery : plates, dishes, cups, and other similar items used to keep food while consuming it.

Dock : to disembark or unload and represents the last step before loading trucks to head for the tarmac.

Equilibrium relative humidity (ERH) : is the relative humidity of the atmosphere at a particular temperature at which a material neither gains nor loses moisture.

Farsans : Gujarati snacks are collectively known as Farsans.

Foreign material : means any unwanted object that may cause adulteration to the food. It can be hair, insects, dust, and glass particle or anything undesirable to food, it may cause illness or injury to the consumer.

Galley : part of an airplane where most of the commissary equipment is located (ovens, carts, etc.).

Garnish : add an eye appeal to the finished salad or soup

Gateaux : a rich cake, typically one containing layers of cream or fruit.

HACCP : Hazard Analysis and Critical Control Point. This is a regulatory procedure that ensures safety of food items by establishing control measures for each identified risk.

Modified Atmosphere Packaging (MAP) : replacing air inside a package with a predetermined mixture of gases prior to sealing it.

Pulpety : A meatball is ground or minced meat rolled into a small ball, along with other ingredients, such as bread crumbs, minced onion, eggs, butter etc.

Purée soups : Pureed soups or Potages purées are soups, that are thickened through pureeing their main ingredients, especially high–starch vegetables.

Sauce : liquid or semi–liquid mixture that is added to a food as cooking ingredient or accompany with it.

Seal : Cover with an airtight closed lid, either with a food dome or by heat–sealing with a plastic film.

Snack : is a food generally eaten between meals and is smaller in portion size than major meals of the day.

Trolley : The trolley is the cart in which meal trays are stored on–board an airplane.

Vacuum Packaging : air is drawn out of the package prior to sealing without introducing other gases.

4.16 ASSIGNMENT :

1. Discuss the factors that are leading to flight caterers seeking alternative approaches to waste.
2. Identify the challenges to waste management in flight catering.
3. Discuss the pros and cons of disposal of waste from in flight catering.
4. Identify the ways in which flight caterers can utilise reduction in their approach to waste management.
5. List the main ingredients of the salad.
6. Make a table of 5 salads and find out what is used for the base, body, dressing and garnish them.
7. Write name 5 salads of your own choice also write their bodies.
8. Is the dressing based on a vinaigrette or mayonnaise ?

4.17 ACTIVITY :

1. Make a list of items goes well with
   (a) Tartare sauce
   (b) Cocktail sauce
2. Make a list of accompaniment goes with soup's of Asia, Europe, America (enlist atleast 4 soup of each continent).

4.18 CASE STUDY :

❖ **Oberoi Flight Kitchen, New Delhi :**

This flight kitchen was opened in 1980 and is located approximately three kilometres from Indira Gandhi International Airport. With a capacity of 5,000meals a day it presently averages 4000 meals a day. Oberoi has long–standing contracts with a range of European, Middle–Eastern and Far–Eastern airlines like British Airways, KLM Royal Dutch Airlines, Thai Airways, etc. In addition, its latest contract is with the high profile domestic airline, Jet Airways. The unit employs 330 staff and is an ISO 9002 certified unit for HACCP by BSI, UK. A feature of this operation is its very clear environmental management system. This includes **:**

- Published environmental policy (available on notice boards around the site)
- Clear responsibilities for activities and environmental issues
- Environmental committee meets regularly and points discussed are minuted
- Consumption of key energy resources such as Light Diesel Oil (LDO), electricity units and fuel (cooking gas) are monitored on a daily basis by the Chief Engineer. The monitoring is done with the use of individual meters installed in each area which reflects the consumption each day and is recorded for comparison
- Each individual machine has been tagged with the consumption of electric units it consumes per running hour and the cost per running hour to increase awareness of the staff and the end user
- Staff are briefed on key issues/consumption patterns and encouraged to suggest ways of conserving energy
- Poster campaign on relevant environmental issues
- Company suggestion scheme covers environmental ideas
- A number of recent initiatives have been taken to reduce the unit's environmental impact. These include :
    - o Noise–buildings and outlets associated with the back–up diesel generators have been acoustically treated to prevent noise nuisance
    - o Atmospheric emissions–height of the main chimney stack has been increased to meet new emissions regulations
    - o Effluent discharges–A new effluent treatment plant on site to treat water and allow recycling of the water for gardens and vehicle washing; the effluent is regulated and monitored regularly to ensure compliance

4.19 FURTHER READINGS :

1. Michael Pollan, Cooked : A Natural History Of Transformation
2. Thangam E. Philip, Modern Cookery : Vol. 2, Orient BlackSwan

BLOCK SUMMARY :

Supply chain management and business logistics management or logistics are terms often used interchangeably. However, Logistics is one link in the supply chain. It is an important part of the supply chain and deals with the planning and control of the movement and storage of goods and services from their point of origin to the destination where it is delivered to passengers. Logistics management begins with the raw materials and ends with the delivery of the final product. Logistics management ensures timely delivery of goods or service to the consumer in good condition. An efficient supply chain management process depends on reliable suppliers.

Manufacturers also try to sell their product in airline that enables them to get more idea to improve their products. The airlines might also wish to negotiate larger discounts or, where they have other subsidiary interests, ensure that those interests have a higher priority and are used in preference to others. This means that many flight caterers are required to work with products that have been developed and selected by somebody other than themselves, and perhaps would not.

Product specification is a concise description of a good or service that is to be buy must fulfil, and the requirements the vendor must meet in order to be considered during delivery. It may include requirements for testing, inspection or preparing an item for delivery, or preparing or installing it for use, requirements for samples, descriptive literature, warranty, and packaging.

The aim of the storage system is to ensure no or minimum loss of value of purchased goods. Losses can be spoilage or theft. Perishables and semi–perishable foods are prone to be affected by bacteria, viruses and other pathogens. So, all supplies must be stored and used with the first in, first out system.

Inventory is stock or store of goods in the premises. These goods are maintained in stock to meet the demand. It is either service industry or any other customer goods providers, establishment have to keep their stock update (either raw material or finished goods), and if the firm does not have the required item in stock customer will find some other organisation for their need. There are two types of inventory system : Periodic (Manual) inventory perpetual inventory systems and systems. The main difference between these two is frequency of tracking.

Inventory exists in various categories as a result of its position in the production process (raw material, work–in–process, and finished goods) and according to the function it serves within the system (transit inventory, buffer inventory, anticipation inventory, decoupling inventory, cycle inventory, and MRO goods inventory). As such, the purpose of each seems to be that of maintaining a high level of customer service or part of an attempt to minimize overall costs.

In order to hustle free and smooth operation by server (Airhostess/flight stewards), correct quantity of products must be issued as per estimated guest demand. This process is carefully monitored and controlled to minimize product misuse and so it is responsibility of managers/supervisor to match issues of items with the amount of revenues they are going to produce.

Cooking is an act of preparing food suitable for consumption and make easily digestible and intention behind cooking is to make changes of physical as well as chemical changes. By applying heat to a food, transforms it both chemically and physically, thus its changes its appearance, texture, colour, flavour, consistency, and nutritional properties as well destroys bacteria.

Food need to store in cold rooms before preparation and cooking. Normally it is planned to situate on the right–hand side of the main corridor. Cold room or walk–ins have different sections for storing of foods having different storage temperatures for example vegetables and fruits, milk, meat, fish, cheese, and so on need different temperature to be stored safely. In another sections of kitchen cold and hot sections are placed. Besides the sections pastry kitchen (also called bakery & confectionary) is placed which is separate from both the hot and cold kitchens having separate cold stores too.

Kitchen staffs are backbone of the production unit, careful planning of their duty schedule is highly required in order to smooth functioning of production operations.

It is very important for caterer deliver foods and beverage with adequate temperatures, so temperature control is very important at every stages. Therefore the catering companies are equipped with a fleet of cold trucks for transportation of food from kitchens to the aircraft. Once the food is reached to airlines it is transferred to large trolleys which are then crews moved by the crews. In the case of food that is to be served hot, soon after take–off the cabin crew begins heating food. For heating usually placing the dishes in a convection oven that rapidly warms the food then it is placed on trays, and serving them from a trolley. However airlines also provide freshly prepared meals to the business class and first class, plated with cutlery.

Convenience foods can be said as tertiary processed food which is prepared commercially for ease of consumption without or with very less processing efforts. The basic features of these foods are sold as hot, ready–to–eat food, as room–temperature, shelf–stable products; or as refrigerated or frozen products and also take less time and more comfort in consumption. Items are portion controlled, single serve packaging designed for portability.

BLOCK ASSIGNMENT :

1. How storage of food items is important for in–flight catering ?
2. What are the objectives of supply chain management ?
3. What are the steps of receiving of in–flight goods ?
4. What is inventory management and its various type ?
5. Explain the methods of stock valuation.
6. Make a list of kitchen equipment in different areas and explain the use.
7. Write a short note on HACCP.
8. What is convenience food and its types ?

FLIGHT CATERING

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ISBN 978-81-945630-8-2

Edition : 2020

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

FLIGHT CATERING

Contents

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BBAATR-106

Flight Catering

BLOCK 3 : INTERNATIONAL LOGISTICS

INTERNATIONAL LOGISTICS

Block Introduction :

Loading and unloading of prepared food and then transportation to the flight is challenging yet very specific task. It need to be done with perfection. A set procedure of loading and unloading by skilled staff at various location with the help of proper machinery and equipment is very necessary to learn. This block provides an opportunity to learn to get to know this here. Further, how international logistics work. Inventory management, warehousing, transportation and required information system can be learnt in this block. The issues of logistics are briefly mentioned in this block. Lastly, an important topic of airport capabilities is also discussed covering topic like customer expectation and experience, selection of right employee, employee training and deciding key performance indicators of an employee. Lastly, this block discusses various categories of airports around the world. The current issues and future development is also discussed in brief here.

Block Objectives :

After understanding this block learns will have knowledge of :

- Transportation vehicles use for prepared food and use of uplifts
- Staffing and operational issues
- Issues related to logistic decisions, warehousing, transportation and loading system
- Current customer issues & future Development in aviation industry

Block Structure :

Unit 1 : Transportation and Loading

Unit 2 : International Logistics

Unit 3 : Airport Capabilities

UNIT 01 *Transportation and Loading*

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

Identify the different types of uplift :

- Examine staff capacity in matching the complexity of dispatch
- Discuss the issues of loading

1.1 INTRODUCTION :

It is necessary to understand the impact of flying on the physiology of the passenger, to manage a complex supply chain, assure the safety of the food and beverages, apply the principles of international logistics, utilise increasingly sophisticated information and communication technologies, and engage in on–going research and development. In previous chapters we have understood how supply chain and safe food delivery system works. Now in this chapter we are going to understand how the loading and transportation works carried out. Once the food, beverages and other catering supply is ready to supply in airlines, it need to be ensure to load it on trucks and transport it into the Cargo bays. It has high–level platform so that items from the vehicles can be unload easily. A temporary storage is available near bay so that checking can be carried out and makes it suitable for loading into plain. However in case of unloading from flight

are to be sent to checkout area or need to be returned to production units, hence checking and unpacking of delivered items are required. After receiving items are send to respected sections of delivery. For instance luggage of customer are sent to check out area for further process and cutleries, crockery, trays and trolleys along with unused catering items such as leftover foods and beverages, other supplies need to send to production unit for waste disposals, cleaning or storing of unused package of beverages.

1.2 UPLIFTS :

Innovative food offering processes requirement drives in–flight caterers to concentrate on work with the individual airlines. After Meals are cooked in commercial kitchens, assembled and packed for storage in either deep frozen tray, bagged fresh or ambient temperature "box meals." When it is required to send on flight then stored as food packets and packed into cartons and then delivered to the flights kitchen. The food is stored in the heat box, where the food is preserved and then it is served as we know.

It is vital to have all uplifts in a position to 'ready–to–go' to if in case of a quick turnaround so that cabin crews have hassle free operation on board. Flight kitchens had to be ready to cater a long haul too. For that it has to equip with space for large refrigeration unit in the case of large volume requirements. Depending on the contract between caterer and airline, loading and unloading procedure may vary from airline to airlines or caterer to caterer. The caterer also has to ensure that the cabin crew has all the required things in adequate quantity. Timely supply of items such as cookies, Tea bags, coffee sachets, soft drinks, and so on. Small aircraft may have requirement of a supply of hot water, which is arranged by caterers itself. In case of full service procedure (first class and business class) unloading of entire cutlery, crockery and other things spoiled need to be unload from flight and resupply items for next take–off. However it is also consider that the production unit systems and galleys location have a complex connection with loading and transportation system. Moreover it is to consider that the planning has to be so clear so that it can avoid any accidents to airline catering staff caused by falls from high loader platforms in hustle or during fast loading or unloading. Sometimes the accident arises due to use of improper ground support equipment.

The service may vary in different hauls. For instance long–haul flights may have improved and more elaborated service while short hauls may not get that much attention as compare to that of long hauls. The term "Haul" it is often used in commercial airlines based on flight length they may be categorised as long haul, medium haul or short–haul. However, it should be noted that there is no specific definition regarding this in international industry.

Long Haul : In long haul, full uplift provides this loading all the food and catering equipment and have a complete new cabin as well, e.g. seat–pocket supply, headrest covers, toilet items and food items such as coffee sachets, cookies and so on etc. restoration of cabin is done completely by the caterers if items are not placed accurately or if some items are less in adequate numbers, the crew has difficulties in serving on–board. Although Service are provided by service companies or the departments affiliated to the airports, however, the caterers, and though outsourcing too, may provide services such as laundry and other related service.

Full galley uplift in long haul includes an exchange of meals to be served/ provided, beverages, headphones, and other goods like ketchup and vinegar, but no cabin supplies, mainly at Layover this task is carried out. Majorly long–haul flights are turning towards non–stop, galley uplifts is limited.

Return catering can be done in two ways first way is to provide the complete load and second is go for restocking through a local agent. In first case all food and beverage items are loaded in the hold in containers with refrigeration facilities, these items are then off loaded at the destination and taken to the flight production unit for further preparation and it is then processed after processing again loaded to the aircraft. Due to bulk packaging this method enables less space consumption.

In second case return catering is done by local catering supplier, where they predetermined as per aircraft requirement and prepared with all the required foods, beverages and other supplies and load it after unloading and clearance is done. It may take few hours to load, as these loads do not required further processing. Usually at turnaround port items are simply moved from one location on the aircraft to another. The reasons for this could be quality, cost (price level, double transport, and loading), or logistics (double stock–keeping). Mostly airlines use a combination of both the options, i.e. some items being back catered and some being provided by local agents. Sometimes the actual number of passenger differs then top–up service is required to balance the items for that exceeded amount of return meals and other items loaded. In this case a limited amount of equipment might be stocked.

Short haul : In short haul aircrafts, full uplift means loading of required cabin items and it usually done for the first departure after the night hold. Beverages, dry goods, and other standard loads are often designed to last several legs. Food or meals only are then uplifted at subsequent destinations, with top–up items loaded subject to requests from the cabin crew (e.g. soft drinks or ice cubes during the summer).

Sometimes last minute adjustments may require in addition to the general loadings, it can be adjusted by providing a small refrigerated vehicle equip with a variety of items and meals on it. The items and meals are then transferred from this vehicle to the aircraft. In case of last minute order the meals can be provided till the closing of doors.

Besides food items, equipment, amenities there are several other items needs to be included in a load. This includes duty–free items on flights where this service is provided. Some airlines include newspapers and magazines with the catering uplift, and blankets, headsets, and free gifts which may be provided as part of the cabin service are also included in uplift. This is mainly happen in long–haul flights. These additional items are assembled as part of the load and picked up with the catering uplift. Normally duty–free goods also include non–alcoholic bar items are collected from custom stores.

1.3 TYPES OF LOADS AND VEHICLES USED :

Different loads : Aircraft has to carry different types of cargo along with passenger luggage and airline meals. To ensure safe operation it is necessary to load an accurate estimate of weight for particular type of aircraft. For instance Boeing–737 has an operating capacity of 2 tons and a volume of 13 – 15 m3. However it is considered as a small aircraft compared to Airbus–340 which is mainly used for transporting bulk and large cargo has a capacity of 16 tons. Jets are the largest among them and are also called twin–aisle because of two separate aisles running from the front to the back of the passenger cabin generally. These are majorly used for long–haul flights between airline hubs and major cities. A smaller but more common class of airliners is the narrow–body or single–aisle. These are generally used for short to medium–distance flights with fewer passengers than their wide–body aircraft. So it is not only about freight carrier but passenger carriers also have to be loaded correctly and securely as per the capacity of it in order to prevent movement in flight. The passenger planes are different from cargo aircrafts, passenger planes predominantly fly with travellers and minimum luggage whereas cargo provisioned for the transport of goods only.

However, loading on either type of flights need to be done accordance with the generally applicable regulations and limitations, operators loading procedures and instructions of Load Planner responsible for the loading process for that flight. During loading instructions are followed in accordance to match the requirements for baggage/cargo distribution stated within the aircraft load and trim sheet.

In long hauls luggage are packed in Unit Load Devices (ULD), which enables tightly hold of luggage in those containers so that they cannot move

within the hold in flight. Containers are emptied after arrivals so the baggage can be re–sorted. At the departure airport they need to be packed and pre–sorted to minimize the amount of sorting at a hub. On short hauls, regional jets and older aircraft where ULD is not used, individual bag is loaded and transported to and from the aircraft on open carts which are assembled to small trains.

On arrival of ULDs or the carts inside the terminal, the bags are unloaded into the baggage handling system, a collection of conveyor belts, barcode readers and switch points. Since every bag received a sticker with a big barcode upon check–in, the reader can report the barcode of the next bag to a computer which sets the switch point accordingly. Traditionally ground crew used to do sorting by the help of portable barcode reader the bags are placed on the right conveyers.

Once the sorting is done, the bags are deposited either at a ULD packing station or an empty cart for transportation to their respective flight. In case of check–out baggage are routed onto baggage carousels for pick–up by their owners/passengers.

Vehicles : Aircraft catering vehicles are designed in such a way so that rapid transfer of catering trolleys and other supplies to and from aircraft as part of the preparation of aircraft for flights can be done easily. These vehicles have a van body mounted on a standard vehicle chassis. These van bodies scan be raised up to the aircraft door. However, it can be vary between airports, individual companies, and to cater for different types of aircraft. Delivery and pick–up are closely timed with aircraft departure and arrival. By using these transportation vehicles enable to ensure safe and secure transportation of trolleys and other items without any damage. The loads inside the vehicle are secured by straps hooked on to sockets in the walls of van. In some vehicles drop–down shelves are present in order to transporting box containers. The vehicle doors are sealed for security concern usually by plastic seal through the rear door lock.

Vehicles are not required to have refrigerated except for those used for buffer stock for last minute adjustments of meals. Because it is cost intensive Refrigerated trucks are not only more costly, but and due to insulation in the walls make smaller interior capacity. However, refrigerated van/trucks help inflexible operations.

1.4 UNLOADING PROCEDURES :

As soon as an aircraft lands and next flight/take–off preparations has to start. These preparations include various activities like unloading the carried goods, passenger's luggage, cleaning of cabin and seats and so on. All these tasks are time incentive but crew members need to bound it within take–off schedule, because beside unloading of arrival flight, loading of meals, luggage and so on need to do or next departure flight. However specialized machines and well–coordinated teamwork ensures and provide comfort in this regards.

With the continuous advancement in technology and automation facility in process, provide ease in off–loading, recycling, waste deposing, storage and other unloading activities. These not only provides ease but also reduces time involve in entire process of making flight ready to re–fly. After offloading of arrival flights there are several waste, dirty ware (crockery, cutlery, glasses and so on.), equipment, water and servicing chemicals needed to be treated. We have already studied in previous block and know the waste disposal process of kitchen and galley waste.

Trolleys are wheeled so it is unloaded manually from aircraft and send it by the loading trucks for cleaning and make it ready for next loading in next flights. It is not necessary to use same unloaded trolley as it need to be cleaned and sanitised. An adequate number of trolleys are available for use as offloaded trolleys has to go for different treatments like removing of soiled trays, waste etc. then need to be cleaned, dried and sanitised then only it is ready for next use. Trolleys can be raised hydraulically to a comfortable working level that enables ease in cleaning and maintenance.

Used trays are unloaded from trolleys within hours of landing, and transferred by hand onto conveyor belts associated with the ware washing system, which has special wash tunnels for trolleys, as well as for crockery, trays, and other equipment. Upon emerging from the washers, trays and ware are stacked in special baskets and taken to storage locations on trolleys, or via the automated transport system.

Alcoholic drinks trolleys have to move in a different secure area if they hold duty–free or duty–paid drinks. The next step is to remove the drawers and replenished and the trolleys are labelled ready for the next flight. Soiled trolleys are now treated similar to other trolley and they are now ready for re–use.

Other supplies such as blankets and sleeping suits need to be laundered, loan items such as stereo head sets are needed to be checked for its functioning and sanitised whereas complimentary items like games and toys for children, first–aid boxes combs, toiletries, socks, and other items may have to replenish. Unused goods are generally returned to suppliers for checking and repackaging. Damaged items and packaging wastes can be sent to waste storage area by means bins or belts or, after shredding, through the vacuum system.

1.5 OPERATIONAL STAFF REQUIREMENT IN LOGISTICS :

Staffs are must to run the operation of logistics at aviation. The staff must be skilful and technically qualified. The requirement

1.5.1 Ground Staff :

Ground Staff plays an important role in airport handling. Their main job is to ensure that the passenger have no difficulties during and after the flight by

solving their queries, providing flight information, carrying checking security activities, handling the unloading and loading, assisting passengers with children and disabled passengers, and preparing the flight plan etc. some of these tasks are carried out computers but these staff are so important that they cannot be replaced with machines or computers.

1.5.2 Baggage Handler :

Baggage and cargo handlers are responsible for load and unload passenger baggage, mail, food supplies, and commercial freight and so on. Handlers may also operate baggage conveyors, forklifts, and various freight vehicles. These jobs have physical requirements as they may have to lift the heavy luggage and other heavy items to and from the airline. They also have to ensure the loads are properly secured within the hold to prevent them from shifting during flight. It is also important to keep baggage in right plane. Tracking down of lost baggage may be frustrating job of.

1.5.3 Airport Driver :

Drivers are responsible for operating food trucks, baggage truck, cleaning equipment, employee buses and other equipment. They are also responsible for checking and maintaining the vehicles. Some drivers have regularly scheduled stops, while others make deliveries or pickups on an as–needed basis. Sometimes they have to work in adverse climatic and poor road conditions. They also have to meet supply of any last minute adjustments. Aircraft loading vehicles are normally crewed by a driver and a loader.

1.5.4 Load Planner :

A load planner is a person responsible for streamline the aspects of transportation process for the airlines .For this they perform activities like load planning, coordinate load assignments, and handle administrative paperwork and computer entry duties. The main objective is to verify that the customer's needs are met in a prompt and professional manner by keeping in mind about flight capacity. Sometimes they may have a flexible work schedule during lean season but in peak season it may be chaos for them. Besides properly load a transport vehicle they also have to grapple with various aspects of the airline industry. Sense of urgency, priority of shipments, cost performance and effective, convenience etc. are core function among load planning.

1.6 OPERATIONAL ISSUES IN LOADING AND UNLOADING :

Airliner has to carry passenger luggage in their cargo compartments that is needed to be loaded and unloaded in short order so time constraint is major challenge in loading and unloading. Entire process is depend on several people includes chefs (who prepares foods), food packers, loaders & unloading (at production unit), suppliers (responsible for timely delivery), drivers, loading & unloading staff (at airport) and so on therefore flight crews are depend on getting meals and other supplies for particular journey. They also have to rely upon assurances from other persons that their aircraft is free of contaminant after treatment at 'off–gate' or 'remote' sites.

Moreover, loading or offloading may cause the aircraft to tip because of load fluctuation, temperature fluctuation and so on. Generally unloading is done prior to load in flight. Procedures for tip prevention are to offload aft holds before forward holds and load forward holds before aft holds. During any loading or

unloading in an aircraft, the tail support or 'tail prop' is required to prevent the plane from tipping over backwards. Objects having heavy weight and long items become challenge sometimes as these items restrict flexibility, however, individual pallets and ULDs supports in these regards. The dynamic nature of industry force challenges of changes in production or service logistics due to changing behaviour and demands by passengers and/or other stake holders, since change in policy also affects transportation of load. Changes in the scheduling of global supply chain operations have tremendous impact on the performance of an individual as well as organisation.

We can sum up these challenges arise due to changes and that involves scheduling & rescheduling costs, machine loading problems, fluctuation in capacity utilisation, inventory management, managerial intervention and so on. However this challenge can be coping–up with accepting behaviour as the system has to be like this.

❑ **Check Your Progress :**

1. The term 'Haul' is used in commercial airlines based on the _____.
   (a) Flight length (b) Number of halts during journey
   (c) Both (a) and (b) options (d) None of the above options
2. Boeing–737 has a operating capacity of _____ tons and a volume of _____ m^3
   (a) 2 tons and 10–13 m^3 (b) 2 tons and 13–15 m^3
   (c) 3 tons and 13–15 m^3 (d) 3 tons and 10–13 m^3
3. Return catering can be done in _____ number of ways.
   (a) 1 (b) 2 (c) 3 (d) 4
4. Which is not the operational staff category in logistics at airport ?
   (a) Ground Staff (b) Baggage Handler
   (c) Load Planner (d) Travel Agent
5. For logistics at airport special type of vehicles are required.
   (a) True (b) False
   (c) Can't say (d) None of the above option
6. Full form ULD is :
   (a) Unit Load Devices (b) Union Load Device
   (c) Unique Load Device (d) Ultimate Load Device
7. Airbus–340 which is mainly used for transporting bulk and large cargo has a capacity of _____.
   (a) 14 tons (b) 15 tons (c) 16 tons (d) 17 tons
8. In order to have quick turnaround all uplifts must be in _____ position
   (a) Read to go (b) Occupied
   (c) Both (a) and (b) options (d) None of the above

1.7 LET US SUM UP :

An efficient baggage–handling system is of critical importance to the aviation industry, especially for major hub airports that handle large volumes of passenger and connecting flights. Systems have to be efficient, reliable and meet

the high safety and security standards imposed on the aviation industry. As a result automation systems often involve major investments and complex infrastructures.

Inadequate packing and improper marking of luggage and other loads may lead in efficiency in operation. A set of containers and pallets, known as Unit Load Devices (ULD), must be loaded into a compartment of an on–going aircraft. Transportation plays a highly significant role in smooth functioning. At the same time the load planner need to optimise loads. A correct load also helps in safety whereas inappropriate loading, on the other hand, can cause consequences like Loss of Control, Runway Excursion during take–off and landing etc.

However, generally airlines out–source the loading and unloading activities from the caterer. So the responsibilities lie on both caterer and the airlines. Precise loading and unloading arrangements are specified along with the level of service required, including the access arrangements and the relationship with other ground services. At the same time caters have to consider cost involvements on entire activities as well as individual segments of activity too. They also have to focus on optimising of resources without breaching the agreement of delivering level of services. A close and careful monitoring of unloading items and procedure is equally important.

1.8 ANSWER FOR CHECK YOUR PROGRESS :

1. (a),	2. (b),	3. (b),	4 (d)
5. (a),	6. (a),	7. (c),	8. (a)

1.9 GLOSSARY :

Baggage : Passenger personal property or other passenger articles transported in connection with a journey.

Baggage Cart : A towed vehicles used for ramp transport of bulk freight, baggage, and mail.

Belt Loader : A vehicle equipped with an adjustable height belt conveyor designed for loading/unloading bulk cargo.

Bulk Cargo : Loose cargo, not unitized, not loaded in containers or on pallets.

Dead heading : The movement of staff, commercial vehicles in non–revenue mode for logistical reasons

Dolly : A piece of equipment used to move containers or pallets around the airport with the aid of a tractor.

Offload : The process of unloading cargo and luggage from an aircraft.

Pallet : A platform of standard dimensions on which goods are assembled and secured by nets and straps before being loaded as a unit onto an airplane.

Tug : The vehicle used to pull carts of luggage and cargo.

Loading Instruction Form (LIF) : is the usual description of the specification for required aircraft Loading of Aircraft Holds that is completed by the assigned dispatcher or equivalent agent and passed to the assigned hold loading supervisor.

1.10 ASSIGNMENT :

1. Why it is necessary to have tight security imposed on the transportation and loading of flight services.
2. Why refrigerated trucks are required in transportation ?
3. Discuss the factors which affect the organisation of the transportation, loading and equipment used in this stage of the flight catering process.

1.11 ACTIVITIES :

1. Plan to visit production unit of "Ambassador's Sky Chef, Ahmedabad or any other in–flight catering production unit convenient to you and observe the various steps and procedures follow in deferent aspects of transportation of goods for aircraft.

1.12 CASE STUDY :

❖ **The Baggage System :**

A leading company in the industry installed the current baggage system in Terminal Z in the mid–2000s. The baggage system was designed in line with the terminal building and passenger flows. Advanced technologies and automation systems were implemented to improve efficiency, increase service quality and reduce manual work. The equipment company provided the following information concerning the baggage system :

- The baggage system in Terminal Z is one of the world's biggest baggage handling systems, utilizing state–of–art design and the most advanced technology.
- The baggage handling system can sort and transport close to 20,000 baggage items per hour from more than 300 check–in counters. This helps the hub airlines using the terminal to grow its network continuously and successfully.
- The system utilizes a combination of belt conveyor, high speed tray system and tilt–tray sorters, occupying a total area over 100,000 square meters. It offers more than3000 Early Baggage Storage places.
- The IT information system can incorporate and analyse the real–time data such as flight information, baggage barcode and Radio Frequency Identification Devices. The system can thus track, monitor and sort baggage items with accuracy of 99.9 per cent.

1.13 FURTHER READING :

1. Hard Landing by Thomas Petzinger, Jr.
2. Air Carrier Operations by Mark J. Holt
3. Logistical Management : Integrated Supply Chain Process Book by Bowersox & Closs

■

UNIT 02

International Logistics

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES :

- Identify the nature and role of logistics in flight catering
  - Identify the key logistics issues
  - Evaluate the key logistics decisions
  - Review the major logistics activities
- Concepts of logistics
  - Planning for logistics
  - logistic decisions
  - Warehousing

2.1 INTRODUCTION :

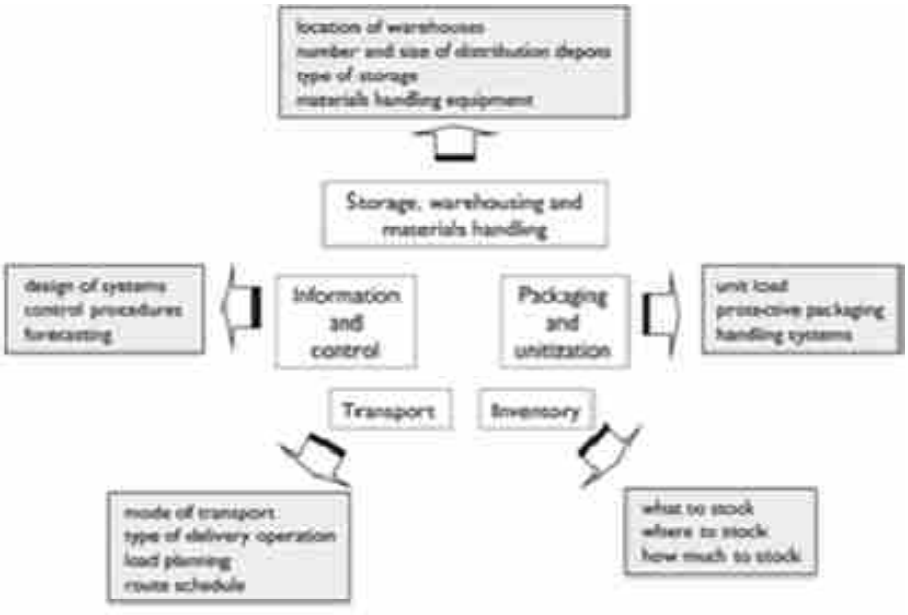
Logistics is the management of all activities which facilitate movement and the coordination of supply and demand in the creation of time and place utility. (Hesket, Glaskowsky and Ivie, 1973)

Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. (CSCMP, 2012)

International logistics can be inbound logistics, outbound logistics, and reverse logistics. Inbound logistics refers to the movement of goods between 'manufacturer' and their 'suppliers' whereas, outbound logistics is the flow of goods between 'warehouse' and the 'consumer'; and reverse logistics means that product movement from the consumer back to the supply chain. In inbound logistics the movement, storage, and transportation of various products and information from the suppliers, through the warehouse, and further through production facilities of manufacturers for processing and production. These logistics items are raw materials. Outbound logistics is the movement of finished products or any other items and information moving from production facilities to the next supply chain link. These goods move through warehouses, further to the point of consumption. In return logistics items are moved from the consumer back through the supply chain to the concerned party. Generally this happens when the end–users do not find the products as per desire and it need to be returned it back. Other reason for returning may be breakage, servicing, repairs, refurbishing, resale, recycling, recovering, and so on.

We can easily say that the airline catering is more likely based around logistics. As we have already seen in previous chapter; the main aim of airline caterer is logistics and little of meal preparation. Roughly we can sayit is more of logistics and less of cooking. It has been observed that the logistics through air is more expensive then Road, Rail, and Sea there for it is used only in case of light weight cargo, perishable cargo, and priority shipments or in other conditions where shipping would not be possible. Airline caterers are bounded in mutual concern with airlines for all the logistic activities. However it may depend on contracting terms between them.

In airline catering logistic activity serves both types of items; meals and other items provided on–board as well as cargo. Logistics and transportation are often being paired together as the term however; both should be understand as per their aspects of the distribution. In transportation activity there is movement of goods, and logistics activity includes the management of the inward and outward movement of goods from the manufacturer to the customer. Some people used both terms interchangeably, intentionally or unintentionally. The key components of logistics are transportation, inventory, warehousing.



The key components of distribution and logistics

As we come across in previous chapter about meals and other passenger supplies are transported to aircraft to serve on–board. The meals and supply are in bulk amount which is large in numbers and there are varieties of items which must be loaded for passenger service during a flight are considered. Logistics is to concern about non–consumable or non–disposable stock too, although other types of inventory like alcoholic beverages and duty–free items are also required to be loaded in flight. In order to use these stocks effectively and efficiently, logistics has to keep eyes on :

- Material demands
- Shelf life of products
- Sourcing of products
- Contracting suppliers
- Purchase contracts
- Transportation
- Warehousing
- Inventory
- Galley and trolley planning

Basically the airline industry has global dimensions, highly competitive. The profitability of business depends on maximising revenue in the face of variable demand. The brand value are creation and maintenance can be done by enhance quality standard and consistency, however it is also require to have logo on items provided. Due to this practice a specialised manufactured is required to involve in the production and supply of these items and hence local supply of these items may have to ignore. Thus, the logistics system has to be organised in such a way that they must be capable of adapting to these variations in the terms of both passenger service as well as airline requirements.

The variation in number of Passenger, affect the size of uplifts for meal trays if the constant numbers of meal packets are loaded, there are chances of spoilage of these unused meals. We also come across that each class have different level of service and meals, hence these meals cannot be provided as 'last minute adjustment' in other classes. However, equipment levels have to remain constant despite of numbers. 'Dead headings' have been adopted by aircrafts, which is also cost intensive.

Routes and schedules also give a significant impact on the logistics organisations. Other factors such as type of class, route served, haul, intermediate legs and aircraft configuration may also impact the logistic planning and organisation.

2.2 INVENTORY :

Inventory is one of the logistics elements and it is mainly associated with storage of goods and its movements. As we have studied in previous block of this SLM, what inventory management is and how it is important ? We also came to know that it is concerned with what stock to hold, where the stock is located and how much stock to hold for efficient functioning of operation. In another words we can say, inventory is controlling the flows of goods going into and out of a warehouse. Now one question comes in mind that 'How is this achieved ?' So the answer is; this can be achieved by analysing previous records and data.

By the close analysis of sales data of past orders and mathematical and statistical tools, we can forecast the demands and can be fulfil effectively and efficiently. So we can say it is not rocket science but applying some methods and process we can achieve the goal of customer satisfaction. Inventory management is depending on how variable demand can be; it is a useful tool to help manage the flows of goods through the supply chain.

An international airline could save millions per annum by just reducing stock–holding levels. As inventory management provide maintenance of balance between the cost of investments in inventory and the benefits bestowed in terms of better availability of materials/products. But that does not mean to lower inventory levels simply to reduce the costs involvement as it may be risk of incurring stock–outs. This may leads to other costs in the form of lost or delayed sales/supply. This can impact on service levels or passenger dissatisfaction and perhaps the caterer may be at risk of losing contracts. In international logistic stock–out may leads to situation like delay in flying or cancellation of flight. So the airlines cannot take the risk of it.

2.3 WAREHOUSING :

Another important element in logistics is warehousing which is mainly associated with storage of goods and its security at warehouse. We should not be confused that the inventory serves the same purpose, because warehousing provides space and condition of safe storing or holding of good; remember both are interlinked. At the same time you should keep in mind the flight catering warehouses are different from those of production warehouse.

In airline catering segments there are some goods which needed to be hold for certain period so that the further process can be carried out. For instance in international logistics some goods need to get clearance from custom department so the warehouse holds it till the custom clearance.

Generally warehouse is located nearby airport and central kitchen. These warehouses have mainly four kinds of goods; food items, non–consumables, duty free items and equipment. Among which Food items are perishable with a short shelf life, whereas the non–consumables, duty–free goods, and equipment are not perishable at all. So the flight service warehousing has a different orientation as compared to production or retail warehousing. However as we know caterer are responsible for loading and unloading of passenger luggage and other belongings, so these items also need to be included in it.

Warehouse saves employees time, reduces overall costs, and helps you deliver products and services to flight. Warehouse holds the transported goods till further process. Excellent warehousing helps logistics in significant competitive advantage.

2.4 TRANSPORTATION :

The element which is often being confused with logistics; as we have seen above that inventory management, warehousing, and transportation are core activities of a logistics system. So transportation is a part only and not all about logistics. In general terms we can say 'Transportation services means to the movement of something or someone from one location to another via road, rail, air, sea, pipeline, and vehicles'.

Ok, this major element of flight catering logistics includes transportation of flight goods (food items, non–consumables, duty free items and equipment), cargo shipping (mainly in international logistics) and air transport. We all know the product produced at one place and will be consumed at another place. So it is transportation which enables goods to move from one stage to another within a logistics. Some goods having short supply chains like foods do not need to travel far where as some goods can be transported from all over the world. Whatsoever good type is, the transportation key areas may be Infrastructure, Vehicles and Operations. Better infrastructure helps in facilitating good flows. Infrastructure includes availability of resources. Vehicles include selection of right type of vehicles suitable for transporting good as well as its cost efficiency is also considered. One of the most significant considerations in shipment process is the transportation method. For example if foods from production units need to transferred to flight galley it may require a vehicle equip with refrigeration facility whereas the non–consumables do not require such facility. While transporting passenger's luggage it required to have suitable carts to transport between check–in area and flight and during arrivals from flight to the carousel.

2.5 INFORMATION SYSTEM :

The role of information and control in any process is very important. The airline caterer plan and control the logistical activities related to order fulfilment and other aspects. The information is a system of records and reports used to aggregate, analyse, validate and display data from all levels of the logistics system and are used to make logistics decisions. Operational procedures required information for various aspects and is gather from different element of logistic system. We have already discussed the importance of information required for inventory management. Order levels of an item helps in deciding procurements, purchasing and what orders need to be picked and packed in warehouses and what item needs to be transported to production unit or aircraft. Information systems controls operational procedures and it is designed by the help of information received or gathered. It is also used in forecasting of demand. In logistic logistics system the information is also generated by physical counting of stocks, passenger feedbacks, passenger history and so on. It helps them to provide improvement in service standard. Any breach in information channel may leads to consequences of loss of products, business or any other. We will learn more about information system and control in next chapter (block–IV–Unit1).

2.6 LOGISTIC DECISIONS :

For efficient and effective management of logistics airline catering is highly required, before and in–between the logistic process decision taken is very much important. The logistic requires making a decision in various areas of the process. Whether it is transportation decision, inventory management or warehousing consideration, require a careful decision before proceeds and during operations. A cognitive process resulting in the selection of a conclusion among several possible alternatives available is decision–making. In another word we can say identification and applying of best consideration as per your conscious is decision. Decision making process includes making choices, gathering information, assessing alternative choice and work upon the best choice. It is not one time consideration as the consequences and other on–going hurdle may change course of action. So, logistic decision making too require careful choice

of actions and also need to be prepared well in advance of any change in the process.

If we look closer to the definition 'Logistics is the part of the supply chain process that plans, implements, and controls the efficiency of good's transportation, storage and transportation'. That means decision is also integral part of logistics. Moreover, decisions also enable managers in improvement in swiftness, and clarity of their logistics systems.

Logisticians in airlines logistic make strategic decisions in order to manage uncertainty (customer demands, delay flights, bad weather conditions and so on), customer service and cost. Basically as we know decisions have to be taken with some back–up plans too. So, the logistic decision in airlines catering need to find answer of following questions :

(i) How should items be loaded and unloaded ? (staff requirements)

(ii) Where should these items be stored ? (Warehousing)

(iii) How should these items be transferred ? (Transportation) and

(iv) How much should items be stored ? (Inventory)

The answer of above questions enables the logistician to plan further for various sub planning activities like staff requirements, condition for storing, loading and unloading, transportation, purchase etc. All these planning are directly related to on–time movement and delivery, and to cope up with any emergency situations. An effective logistics is depend on sufficient planning that may involve obtaining product, secured storage, availability of items required and that transportation of the products to the end user is completely optimised for performance.

The global logistics companies such as Kuehne & Nagel, DHL, Panalpina, Schenker, Expeditors, etc. provide logistic service in Collaborating with airlines these companies are known as logistic partners. These companies are specialised in moving goods around the world, often in containers. Using global logistics service providers allows the airline and caterer to better manage the flow of materials from aircraft to flight kitchen and back again. Logistic partners are assisting an airline in various aspects like; Demand–supply planning and forecasting, Transportation (inbound and outbound), Warehousing activities, Inventory management, Galley and trolley planning.

2.7 LOADING SYSTEM :

A logistics centre of flight catering witnessed a large quantities of different types of goods arrive in and depart. Some of these goods are passenger's belongings and some are property of caterer itself that is to either load onto aircraft or need to be transported to production unit where it will be either stored for another use or for dispose of (we have studied in previous chapters).

A close supervision in international logistics is highly required in order to ensure that goods are handled safely and correctly in process and delivered safely to its new owner across the globe where he is intended to. However the airline caterer is responsible for safety delivery of these items till airports. However, sometimes they also provide transportation till next logistic centre (logistic partner). During Loading and unloading it is essential to make sure that no item being harmed during shipping to its destination, for that the loading is done according with that.

As we know the goods are to be kept in logistic chain, are stored in shipping containers of shapes and sizes. Right equipment and person need to be assigned to perform various processes involve in it. It is also important to select proper container for different items. Time constraints in delivery or other process may leads breakage like situation. The loading and unloading mechanism requires ensuring flexibility, optimum space utilisation, energy savings, minimal operating costs and reliability.

2.8 LOGISTICS ISSUES :

The logistics issues of flight catering are affected by a number of important features of the airline industry, the most important being the changing passenger behaviour and choices, delaying flight, weather conditions, political issues, route scheduling, custom laws, and the impact of actual passenger loadings and so on. The issue in Flight catering logistics service does not have a unique problem. However, as outlined previously discussed distinctive nature of these logistics make their issues slightly different from other logistics. Pressure to deliver flight meals and other items on time and in adequate numbers. At the same time luggage are also uplifted, although specialised people are to be employed in each section makes these work easy. It can be said that the character of flight logistics is mixed. Similar to military support system they have the scale of operations and geographical dispersion, but they have purely commercial objectives. From the customers' perspective, the impact from logistics and the catering system in general may seem indirect. For airlines, the impact of logistics may reflects on business activities that means re–flying passenger may reduce hence profitability reduced (more passengers more profit and less passenger less profit). Due to availability of options, passengers have the freedom to choose between one package and 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.

The airline catering businesses have to be flexible in various aspects of customer service.

With the advancement in techniques and strategy airlines are adopting JIT inventories to reducing waste and process cycle–time, the catering units find themselves over–stocked trolleys, trays, crockery, cutleries and so on belonging to their clients (airlines). They have therefore been returning this unwanted stock to airline warehouses. This has led to a significant increase in equipment held centrally and will take some time for airlines to adjust their stocks to appropriate levels reflecting the more streamlined operations now being developed.

❑ **Check Your Progress :**

1. Reverse logistics is required because :
   (a) Goods are defective
   (b) Goods are unsold
   (c) the customer simply change their minds
   (d) All of the above options
2. What are the elements of logistics system ?
   (a) Transportation (b) Warehousing
   (c) Inventory management (d) All of the above options

3. The fastest and most costly mode of transportation is :
   (a) Roadways (b) Air transport
   (c) Train (d) Water transport
4. Which of the following is not a part of supply chain management system ?
   (a) Information flow (b) Competitor
   (c) Manufacturer (d) Supplier
5. Logistics is the part of supply chain involved with the forward and reverse flow of :
   (a) Cash (b) Goods
   (c) Services (d) All of the above options
6. This is not an advantage of air transportation :
   (a) Delivery schedules (b) Time in transit
   (c) Absolute cost (d) Insurance cost
7. This mode of transportation requires the greatest care in packing :
   (a) Air (b) Rail (c) Water (d) Road
8. This transportation mode has the smallest share of total international freight movement :
   (a) Air (b) Water
   (c) Land (d) None of the above
9. The major decision areas of in–flight catering logistic are :
   (a) Planning, production ,distribution, and inventory
   (b) Location, production, scheduling , and inventory
   (c) Transportation, warehousing and inventory
   (d) Location ,production, distribution, and marketing

2.9 LET US SUM UP :

Flight catering is major part of logistics and fewer cooking. The service supply chain is extremely complex, so continuous improvement is required. Warehousing, transport, and inventory management are core activity of airline catering logistics.

The in–flight logistic service industry is a vast and complex activity. Varieties of items are transported and stored on daily basis as per flight take–offs. Thousands of items loaded onto aircraft it before it flies. These items range from meals to headsets, which mean both consumables and non–consumables; passengers luggage to equipment like trays, trolleys and so on. Food items in most cases are still produced fresh while in–flight equipment for crew or passenger use, tend to be recyclable items.

Logistics service providers such as DHL, Kuehne & Nagel, Schenker, Panalpina, etc. are global logistic service providers have setup specialised teams to support airlines in their logistic journey.

2.10 ANSWER FOR CHECK YOUR PROGRESS :

1. (d), 2. (d), 3. (b), 4. (c), 5. (d)
6. (c), 7. (a), 8. (a), 9. (c)

2.11 GLOSSARY :

Aircraft Pallet : A platform of standard dimensions that is used for assembling goods which is secured by nets and straps prior to being loaded as a unit onto an airplane.

Container : A reusable, rigid exterior shipping box that is used to ship goods by ship, truck or rail.

Demurrage : A penalty charge that applies when the ship exceeds the allocated loading or unloading period, or when the goods waiting inside the container are not cleared from customs and unloaded.

Dock Leveler : A piece of equipment that allows handling equipment to move around between the warehouse and vehicle body. Its moving form eliminates the height difference between vehicle bodies of different heights and the warehouse floor, acting like a bridge in between.

Echelon Inventory : Stock at a certain stage in the supply chain to meet customer requirements

Igloo : A container designed to the dimensions of the full main deck width of carrying aircraft.

In–Bond : A customs program for inland ports that provides for cargo arriving at a seaport to be shipped under a customs bond to a more conveniently located inland port where the entry documents have been filed.

2.12 ASSIGNMENT :

1. What is the different between logistics and transportation ?
2. What do you mean by logistic in airline catering how it is different from international logistics ?
3. What is the different between inventory and warehousing ?
4. Explain the global issues and challenges of any logistics.
5. What are the areas should be focussed more in order to improve warehouse transportation ?

2.13 ACTIVITIES :

1. Visit any warehouse and understand about the stacking system of goods.
2. Make a list of equipments use in logistics in aviation industry.

2.14 CASE STUDY :

❖ **Delta, e–gatematrix and Kuhne & Nagel***

E–gatematrix, a member of the Gate Gourmet Group, and Kuehne & Nagel have agreed on a ten–year partnership in the field of inflight logistics. As logistics supplier to Je tlogistics AG, an affiliated company of e–gatematrix,

Kuehne & Nagel has been providing customised inflight logistics services for Jetlogistics' airline customers like Air New Zealand, Aeromexico, SWISS, and South African Airways for some years. From 2002, Kuehne& Nagel, who are already providing sea freight activities for Delta, will cover all Delta services for 20 European destinations. By agreeing on a ten–year partnership, e–gatematrix and Kuehne & Nagel highlighted their intention to extend their in–flight logistics

business globally. Due to the trend that the airlines increasingly outsource activities outside of their core competencies, the field of inflight logistics is a promising market for worldwide operating companies offering logistics and supply chain management solutions. "We have high confidence in the capabilities of the Kuehne & Nagel Group. Their innovative and flexible logistics solutions complement our airline know how ideally. This strategic partnership will strengthen the market position of both companies and will generate competitive advantages," said Niels Smedegaard, President & CEO, e–gatematrix. While e–gatematrix calculates the demand for the required in–flight logistics articles and coordinates the flow of goods, Kuehne & Nagel is in charge of handling integrated services–warehousing and distribution, customs clearance, sea, air and overland transports–as well as other value–added services. The Kuehne & Nagel Group is one of the world's leading logistics companies with 17,000 employees at 600 locations in 90 countries.

2.15 FURTHER READING :

1. The Handbook of Logistics & Distribution Management by Rushton, Croucher & Baker
2. Airline Operations and Management by Cook and Billig

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UNIT 03

Airport Capabilities

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- Importance of customer service
- Importance and Function of the airport
- Understand the importance of delivering effective customer service in the aviation industry
- Be able to provide effective customer service within the aviation industry.

3.1 INTRODUCTION :

Airport, also called air terminal, aerodrome, or airfield, site and installation for the take–off and landing of aircraft. It is a point where air traveller gets their desired service and it is provided by airports and airlines by various means and dimensions. In general terms Airport capacity is a measure of the maximum number of aircraft operations that can be accommodated on the air– port or by an airport component within a given period of time. Terminal airspace, runway system, taxiways, parking areas, terminal, and environment are measures by which capacity is measure. Hartsfield–Jackson Atlanta International Airport (ATL), acting as the primary international airport serving Atlanta, Hartsfield–Jackson Atlanta International Airport is the busiest airport in the world by passenger numbers and second busiest by aircraft movements after Chicago O'Hare (2019). Being busiest airport the responsibility increased in terms of customer engagement, grievances, security and so on. However it is important to know the functions of airports illustrated in the chapter.

Importance of customer service expectation is not unknown to service industry. They have to understand the relationship between exceptional performance and customer satisfaction. The organisations need to monitor performance of the organisation on continual basis by generating customer feedback as well as they also need continuous improvement in services. An organization's performance is closely associated with customer satisfaction. To understand customer expectation first we need to understand the facilities and capabilities of airports and their associates.

3.2 FUNCTION OF THE AIRPORT :

An airport can be an intermediate and terminal point for an aircraft. It has two major components; an airfield and terminals. A typical airfield is composed of a runway for take–offs and landings as well as two (or one) parallel taxiing lanes (taxiway). Runways are labelled according to the direction (rounded magnetic azimuth in decimal) they are facing. General aviation airports often have facilities for pilots, refuelling, and refreshing. Some of them are equipped with business equipment, conference rooms, flight crew quarters, and aircraft mechanic services. Some offer catering and others have more advanced facilities featuring multiple fixed–base operators.

Airport operations are divided into airside & land side functions. After approach and landing an aircraft uses the runway, taxiway and apron prior to docking at a packing position, where its payload is processed through the terminal to the access system. Airport may operate for Emergency medical flights, Aerial fire–fighting flights, Law enforcement flights, Flight training, Time–sensitive cargo services, Business travel, Personal travel and Agricultural functions.

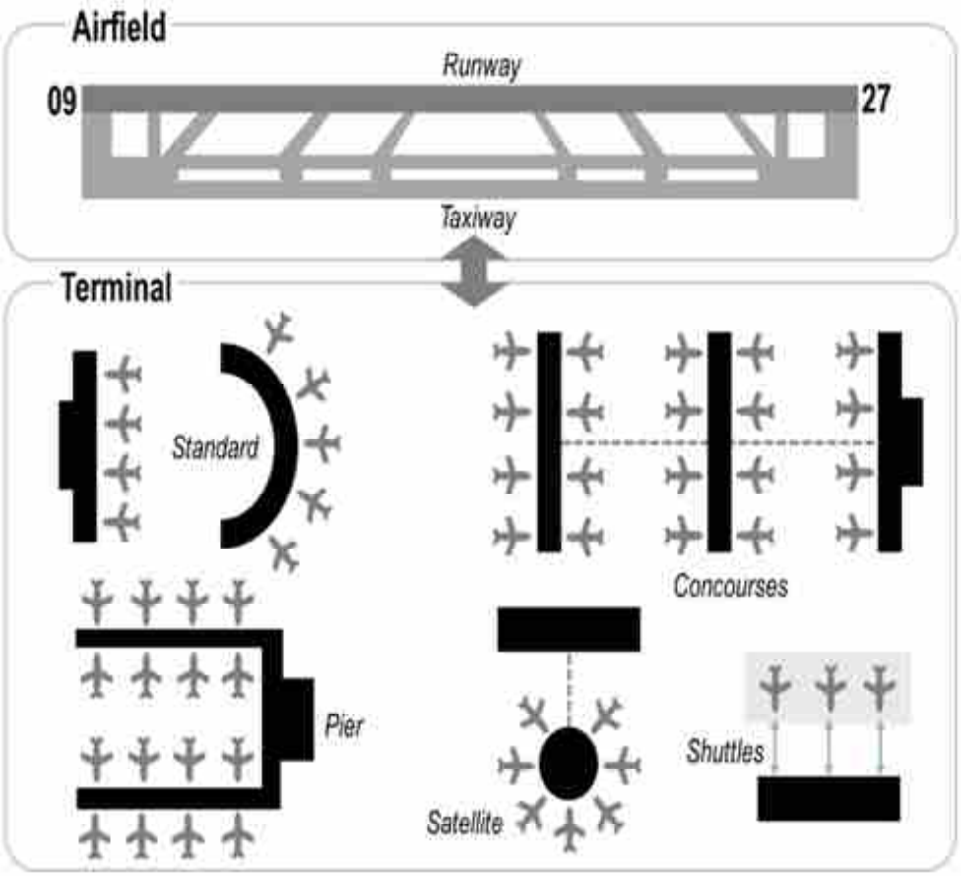
Airports of a significant size must have an organization that can either supply or administer the following Faculties **:**

- Food & beverage sales (restaurants, bars cafeterias)
- Duty paid shopping

- Duty free shopping (alcohol, tobacco, perfume, watches, optical)
- Banks / Foreign exchange
- Airline catering services
- Taxi services
- Car rentals
- Internet services
- Casinos/gaming machines
- Cinema
- Vending machines for other than food
- Freight consolidators
- Art concerts
- Advertising
- Airport /City transport services
- Petrol/automobile service stations
- Hair dressing/barber shop
- Music concerts
- Souvenir shops

3.3 THE OPERATIONAL AREAS OF AN AIRPORT :

An airport is a complex of runways and buildings for the take–off, landing, and maintenance of aircraft, with facilities for passengers.



Hangars : Aircraft can be stored in buildings called hangars to protect them from the weather when they are not being flown. Aircraft maintenance can also be performed in hangars.

Terminal : At an airport terminal, passengers can board and disembark from aircraft. At commercial airport terminals, passengers can buy tickets and check in or pick up their luggage.

Control Tower : A Control Tower is where Air Traffic Controllers work to supervise the efficient and safe movement of aircraft on the ground and in the air. Ground Controllers also coordinate the movement of land vehicles such as fuel trucks and maintenance vehicles that need to cross runways and taxiways.

Helipad : Helicopters take–off from and land on a helipad

Apron/Ramp : Aircraft are parked near the terminal on the apron. While on the apron, aircraft can have passengers and luggage (or other cargo) loaded and unloaded. The aircraft can also be refuelled and receive maintenance. The apron is also referred to as the ramp.

Taxiway : When an aircraft moves on the ground under its own power, it is called taxiing. The path that aircraft taxi on is called the taxiway. The taxiway connects the runway with the apron and hangars.

Runway : Airplanes take–off from and land on the runway

3.4 ENHANCING CUSTOMER SERVICE EXPERIENCE :

Continuous improvement in customer service experience allows airports to improve the travel experience of passengers. An airline alone is not responsible for this. In close association and co–ordination this experience can be enhanced and it turns into re–flying. The strategy need to adopt for better improved service this could be :

3.4.1 Customer Expectation Analysis :

Profile of a traveller comes with level of service expectations. For instance first class and business class travellers cannot be treated as same and likewise other class passengers. However, airport has to be particular about their services whether it is common for all class travellers or not. Sustaining high quality customer service is required by giving considerable preferences. Therefore it is important to know the passengers and their expectations.

3.4.2 Equip Employee with Expectations :

Now based on gathered information it need to be plan an ideal customer service experience. It should be briefed to staff who actually going to execute the plan. It can be done by conveying message in clear, concise, and relevant terms.

3.4.3 Employee Training :

An excellent customer service providing organisation knows the importance of their employee and treats them as most valuable asset rather than a liability. They also concerns about their continuous improvements in skill and other aspects of life of them. It is a fact that customer service begins with the employee. Training has to incorporate with customer service, customer behaviour and so on.

3.4.4 Hire the Right Attitude :

Major role of Human Resource of an organisation aimed to place right person at right place. For putting employee in customer service it is critically analysis of their attitude is highly required. A person with right attitude can make a significant difference in how customers perceive their travel experience.

3.4.5 Recognize and Reward Employees :

Motivation is necessary fuel by which optimum performance can be achieved. Employee recognition program is very much important for improving performance of an individual. Alone recognition do not work always sometimes promotion or monetary like rewards are also option. Sometimes milestones celebration, small party etc. are also some reward where an employee feels rewarded.

3.4.6 Performance Management : Key performance indicators (KPI) :

It is used by organisations to measure their employee performance. Airports utilise performance this metrics to cover areas as business, finance, operations, customer service, and human resources. It should be analyse on a regular basis.

3.5 AIRPORT CUSTOMER SERVICE CAPABILITIES :

Customer satisfaction is always on top priority for service industry. The airports are no exception of it. Continuous change in passenger expectation and demand enable and demands drive the both airports and airline service provider to live up to expectations of their passengers. In a highly competitive global era compel airlines to vie for the top ranking so they have to be engaged in giving lot of importance to the customer service. Therefore the service providers aimed to achieve and sustain, two main objectives the customer satisfaction and customer loyalty.

Airport customer service involves providing support to passengers before a flight, during a flight, and after a flight in airline or at airport (both physical as well as on phone). Task may include providing assistance, information, bookings, reservations, processing boarding passes, managing check–ins and so on. Airports are equipped with number of staff to perform different jobs in the process or chain. However, I cannot forget to remind you that it is also a complex chain, since it involves various processes. Documentation is highly required since they are to handle multiple persons within a day. Security is also prime concern for airport for passengers, passenger's baggage, cargo as well as airport properties and belongings.

Servicing capabilities of airports influences customer service levels and cost control of airlines too. It is more important in case of international airlines operating on the most worthwhile scheduled routes. Generally international airlines serve their passenger from own catering facilities as well as cater to other airlines flying from their hub. They may be their competitor for some routes. Generally Airlines prefer to outsource their catering from local caterer while operating away from their home base. Thus, it is important to maintain relationship among them. Traffic volume highly influences airport's capabilities however other factors may also take a part in this regard.

3.6 AIRPORT CATEGORIES :

As Federal Aviation Administration (FAA US department of transportation) law airports are categorised by type of activities, including commercial service, primary, cargo service, reliever, and general aviation airports. Airline hubs or hub airports are used by one or more airlines to concentrate passenger traffic. These are an airport of second–degree importance in air transportation except for the epicentres. Each airports category has its own unique set of services and different management approaches they follow.

3.6.1 Commercial Service Airports :

These are publicly owned airports that must have at least 2,500 passengers boarding each calendar year and receive scheduled passenger service. Moreover, passengers who continue on an aircraft in international flight that stops at any US airport for a non–traffic purpose. Passenger boarding at airports that receive scheduled passenger service are also referred to as Enplanements.

3.6.2 Cargo Service Airports :

As per definition airports that are served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds. "Landed weight" means the weight of aircraft transporting only cargo in intrastate, interstate, and foreign air transportation. An airport may be both a commercial service and a cargo service airport.

3.6.3 Reliever Airports :

Airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community. These may be publicly or privately–owned.

3.6.4 General Aviation Airport :

Other remaining airports are commonly described as General Aviation Airports. This airport type is the largest single group of airports in the U.S. system. The category also includes privately owned, public use airports that enplane 2500 or more passengers annually and receive scheduled airline service.

3.7 INTERNATIONAL & LOCAL SUPPLY :

Increase in competitive pressure, changes in price, customer expectations, lead time, frequently launched new products, instability in exchange rates, increased level of outsourcing, variability with global sourcing, promotional activities and governmental regulations are causing complexity in logistics function. While we cannot exclude Procurement decisions that makes it more complex than any other factors. There may be considerable difference in contractual and operational obligations to caterers between different airlines. Many airlines may leave sourcing of products and materials entirely to the caterer whereas others do not. So we can say that the sources of supply are specified by the airlines themselves. For most scheduled operators some intermediate position holds in this regards. Major international airlines have significant capability of purchasing so they can negotiate with caterers directly that means no scope for any intermediary. This is most often happen where an airline operates a centralised purchasing system or is part of a much larger holding company. However, some airlines do not simply make any purchasing decisions on unit cost

grounds only. They do it by considering their brand image they want to create for their flight catering and their position as a national carrier, strategic alliances formed with other multinational companies.

When airlines intended to use of 'own branded' products, caterers need to take it from the airlines itself and the supplies come to the caterer from airline's home base. It may result a high level of inventory and warehousing costs. Due to passengers expectation to have tastes of their homes/natives abroad also results in home base shipping of supplies, if no local supplier can be found to meet this expectation. Home base distribution can also be seen in case of products like liquor (which is purchased in centralised purchasing system of airline and handled by the caterer). Here the airline sources the items themselves, and ship them to the home base, now caterer can collect it from there for serving. However caterer may be allowed to utilise local supplies that may affect quality and lower costs.

3.8 CURRENT ISSUES & FUTURE DEVELOPMENT :

Although the past century witnessed the dramatic growth of air transportation, important challenges cloud its future. First, the airline industry must be financially strong enough to continue to afford new generations of aircraft upon which further gains in efficiency and improved environmental performance depend. The development costs of new jetliners, even after adjusting for inflation, are unprecedented, partly because the latest generation of aircraft incorporates so many complex interfacing systems. Meanwhile, the rise of the LCCs has put great pressure on the bottom lines at legacy carriers. Still, it is worth noting that the 2010s were a profitable decade overall for the airline industry, as carriers adopted more sophisticated yield management strategies and generated more ancillary income by charging for extras such as checked luggage and assigned seats.

The financial health of the industry's largest airlines has important implications for the future because great carriers have provided the launch orders for new airliners in the past. Pan Am, for instance, launched the B707 and B747; United launched the B767 and B777; Air France and Lufthansa provided the launch orders for most of Airbus' airliners, and Asian carriers such as Singapore Airlines and All Nippon Airways have been significant launch customers since 2000. By contrast, the LCCs' focus on a handful of smaller, relatively short–haul aircraft limits their capacity to serve as catalysts for technological breakthroughs in aviation (although Indonesian LCC Lion Air was the launch customer for the Boeing 737 MAX, the newest version of the popular narrow–body).

Both Boeing and Airbus promise that their newest jetliners will offer unparalleled fuel efficiency. That is important because a second fundamental threat to the future of the airline industry is the price and availability of fuel. In 2018, fuel accounted for about 24 percent of the operating costs of airlines globally. For air transportation, finding a substitute for oil–based fuels is much more difficult than on ground transportation because the economic viability of flight depends on the use of a concentrated form of explosive energy. There is no easy substitute for fossil fuels in this regard.

A third threat is terrorism and security. The rise of the airline industry was facilitated in part by the steady advance in the safety and predictability of air travel from the early post WW–I (World War–I) days of "Flying Coffins". Terrorism directed against civil aviation threatens the confidence of ordinary travellers, and added security constraints sap some of the speed advantages of

aviation. The September11 attacks caused a two–year dip in traffic levels. The 2001 attacks were the most significant to affect the airline industry in the US. Still, before and after those attacks, civil aviation was a frequent target of terrorist attacks in the Middle East, Europe, and other parts of the world.

The development of airports as the main component of air transport system infrastructure is influenced by direct external developments (such as the globalisation and privatisation of the airline industry, deregulation of domestic and liberalisation of international markets, increased airline competition and volatile prices of the major airlines) and indirect external developments (such as socio–economic forces and political events influencing the growth of air transport demand).

❑ **Check Your Progress :**

1. Busiest airport of the world in order of total passenger numbers in 2019 :
   (a) London Heathrow Airport (LHR)
   (b) Indira Gandhi International Airport (DEL)
   (c) Hartsfield–Jackson Atlanta International Airport (ATL)
   (d) John F. Kennedy International Airport (JFK)
2. Airport is not known by :
   (a) Air terminal (b) Aerodrome
   (c) Airfield (d) None of the above option
3. An area used for taxing the aircraft is
   (a) Apron (b) Taxiway (c) Runway (d) Movement Area
4. A Corridor above/below ground level to connect aircraft stands to the passenger building is called :
   (a) Pier (b) Ramp
   (c) Rampage area (d) Airside waiting area
5. Which of the following is used for servicing and repairs of the aircraft ?
   (a) Apron (b) Hanger
   (c) Terminal building (d) Holding apron
6. An area used for landing/takeoff the aircraft is
   (a) Runway (b) Hangars (c) Taxiway (d) Helipad
7. Federal Aviation Administration categorised airport by type of
   (a) Commercial service (b) Cargo service
   (c) General aviation airports (d) All of the above options
8. Airport customer service involves providing support to passengers
   (a) Before a flight (b) During a flight
   (c) After a flight (d) All of the above options

3.9 LET US SUM UP :

Customer service is a key factor in the operation of aviation organisations as competition within the industry increases. Overall, this unit seeks to emphasise how the importance and application of good customer service throughout an organisation can be the driving force in enabling aviation organisations to gain

a competitive advantage. Airports are now transforming into business hubs rather than only its main function. Also, the traffic has increased due to large number of passengers opting for airways, so the services provided and the quality of airport must be maintained at high standards. For good service there must be a good management which takes good care of the operations of the airport. A hit on one operation has its effects on the other functions as well. Important sectors of airport duties and operations have been explained in this paper. There might be few things unmentioned in this paper but their contribution is required as well.

3.10 ANSWER FOR CHECK YOUR PROGRESS :

1. (c),	2. (b),	3. (d),	4. (d)
5. (b),	6. (a),	7. (d),	8. (d)

3.11 GLOSSARY :

Airline hubs : or hub airports are used by one or more airlines to concentrate passenger traffic and flight operations at a given airport.

Airport apron : or flight line, or ramp is an Aircraft Parking Area of an airport where the aircrafts are parked, loaded, unloaded, refuelled or boarded.

Nonstop Flight : This flight will take you exactly where you want to go, without stopping or causing you to change planes and lose your comfortable position.

Enplanement : The act or process of boarding an aircraft

Hangars : Aircraft can be stored in buildings called hangars to protect them from the weather when they are not being flown.

Passenger boarding : Refer to revenue passenger boarding on an aircraft in service in air commerce whether or not in scheduled service.

Take–Off : When an airplane leaves the ground, the act is termed as take–off.

Taxiway : A path for aircraft at an airport connecting runways with aprons, hangars, terminals and other facilities.

Terminal : The main building of an airport that is used by passengers and cargo.

3.12 ASSIGNMENT :

1. What are the main functional areas of airport ? Enlist and explain.
2. What are the different categories of airports ?
3. What are the recent trends in airport development around the world ? Mention any 3 trends in your answer.
4. How an employee with right attitude and appropriate quality create enhance customer experience ?

3.13 ACTIVITIES :

1. Analyse the below table of airports and passenger numbers to find out the trend and movement of air traffic around the world.

PASSENGERS*					
2019	2018	AIRPORT	2019 total	2019 vs 2018 % change	Q1 2020
1	1	ATLANTA GA, US (ATL)	110 531 300	2.9	20 713 627
2	2	BEIJING, CN (PEK)	100 011 438	-1.0	9 327 109
3	4	LOS ANGELES CA, US (LAX)	88 068 013	0.6	15 787 322
4	3	DUBAI, AE (DXB)	86 396 757	-3.1	17 823 446
5	5	TOKYO, JP (HND)	85 505 054	-1.7	15 064 577
6	6	CHICAGO IL, US (ORD)	84 649 115	1.7	14 873 692
7	7	LONDON, GB (LHR)	80 888 305	1.0	14 648 707
8	9	SHANGHAI, CN (PVG)	76 153 455	2.9	8 077 491
9	10	PARIS, FR (CDG)	76 150 009	5.4	13 093 454
10	15	DALLAS/FORT WORTH TX, US (DFW)	75 066 956	8.6	14 669 491
11	13	GUANGZHOU, CN (CAN)	73 386 153	5.2	8 386 657
12	11	AMSTERDAM, NL (AMS)	71 706 999	0.9	12 271 241
13	8	HONG KONG, HK (HKG)	71 415 245	-4.2	8 168 000
14	17	INCHEON, KR (ICN)	71 204 153	4.2	10 307 810
15	14	FRANKFURT, DE (FRA)	70 556 072	1.5	11 116 585
16	20	DENVER CO, US (DEN)	69 015 703	7.0	13 030 066
17	12	NEW DELHI, IN (DEL)	68 490 731	-2.0	15 618 233
18	19	SINGAPORE, SG (SIN)	68 283 000	4.1	11 047 000
19	21	BANGKOK, TH (BKK)	65 421 844	3.2	11 967 714
20	22	NEW YORK NY, US (JFK)	62 551 072	1.5	11 129 965

Total passengers enplaned and deplaned, pssengers in transit counted once

3.14 FURTHER READING :

1. Materials & Logistics Management by Dr. Kasande
2. Logistics Management reference book by S. K. Bhattacharya
3. Physical Distribution Management : Logistical Approach by Khanna

BLOCK SUMMARY :

After reading this block learner will develop understanding about the aspects of airport logistics management. Here, logistics means loading and unloading of baggage, prepared food and cargo. But before this we have understood the uplifts. The term 'Haul' is important to understand for better management and proper uplifts. Generally each type of uplift is accompanied by the equivalent amount of clearance done. It is an important to ensure adequate supplies of company specific, non–consumable equipment is maintained in flight. Dead–headings in considerable amount needed to balance equipment requirements.

The airport is an essential part of the air transport system as it is the physical site where passenger receives services of the air transport. It is the point of interaction of service provider and customer. For a smooth operation each components of service provider i.e. airports, airlines, as well as other associates have to maintain the equilibrium among each other and passenger as well.

In transporting, loading and unloading fragility can be one of the challenges. It can be solve by consciousness. As the items are packed in ULDs so these cannot move inside the box and at the same time, there is no chance of collapsing with other items or heavy items.

Logistics is the process of coordinating and moving resources, materials, inventory, and equipment from source to storage at the desired destination. The term originated in the military that means the movement of equipment and supplies to troops in the field. In terms of the Council of Logistics Management, International logistics is the process of planning and managing the flow of goods and products in supply chain from acquisition to delivery, where part of the process involves crossing at least one international border.

In this block summary we can sum up that the basic objectives of a logistics system are getting the right products to the right place, at the right time and at least cost. Storage, warehousing, materials handling, Packaging and unitisation Inventory, Transport and Information and control all activities are related to logistics.

Inventory management is a critical function of logistics but we also need to focus its integral importance beyond the logistics network. Inventory is cost intensive too as it requires a capital investment to build and stock finished goods. However, inventory is essential as the time a consumer is willing to wait for a product may be much less than the time it takes to manufacture the product and then ship the products to the customer need location. It has to consider the complex variables such as lead time, location, transport, and service levels.

Airport capability means a lot of things like; the maximum number of aircraft operations at airport, runway capacity, number of flight operations per hours, number of passenger accommodated and so on. But in this chapter we only focus on airport customer service capabilities.

Airports along with the airlines provide customer services and ensure customer satisfaction at the same time. Both of the partners need to understand the customer needs and expectations. To achieve maximum level of customer satisfaction they need to employ and monitor performance of staff involved in

customer service on continual basis whose main duty must be gather customer feedback via convenient mode of customer. These feedbacks and complaint needs to be considered during planning and decision making of the operation to ensure a continuous improvement in services to meet close to customer expectations. We should not forget 'An organization's performance is closely associated with customer satisfaction'.

BLOCK ASSIGNMENT :

1. Explain the issues in unloading and loading procedures of goods.
2. What are the requirement of logistic staff at airport ?
3. Discuss the warehousing, transportation and information system in International Logistics.
4. What is airport capabilities, explain with examples ?
5. According to Federal Aviation Administration what are categories of airports ?

FLIGHT CATERING

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ISBN 978-81-945630-8-2

Edition : 2020

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

FLIGHT CATERING

Contents

Dr. Babasaheb Ambedkar Open University Ahmedabad

BBAATR-106

Flight Catering

BLOCK 4 : FLIGHT CATERING INFORMATION SYSTEM

FLIGHT CATERING INFORMATION SYSTEM

Block Introduction :

The growing use of technology for the uninterrupted work and development in the style of working has been there in this century. The market analysis and market knowledge is must for development of any business and same goes for the flight catering industry also.

The flight catering industry has the major role of flow of information. Lapse in flow of information at any stage will debacle the entire system. This block will develop the understanding about the information system and its advantages. The block will also focus on the barrier which comes in way to successful transmission of information from end to another. The control on flow of information and its scheduling is also understood in this block. Lastly, the major issues faced in the information system, its market segmentation and management is also learnt here by the learners.

Block Objectives :

After understanding this block learns will have knowledge of :

- The meaning of Information System and its requirement
- Advantages and use of Information system
- How to take customer feedback and expectation
- Information flow in system and its barrier
- Operation on Information Flow
- Control on information and its scheduling
- Issues related to information system
- Market segmentation of information and management

Block Structure :

Unit 1 : Information System

Unit 2 : Flight Catering Information System

Unit 3 : Information Integration System

UNIT 01

Information System

UNIT STRUCTURE

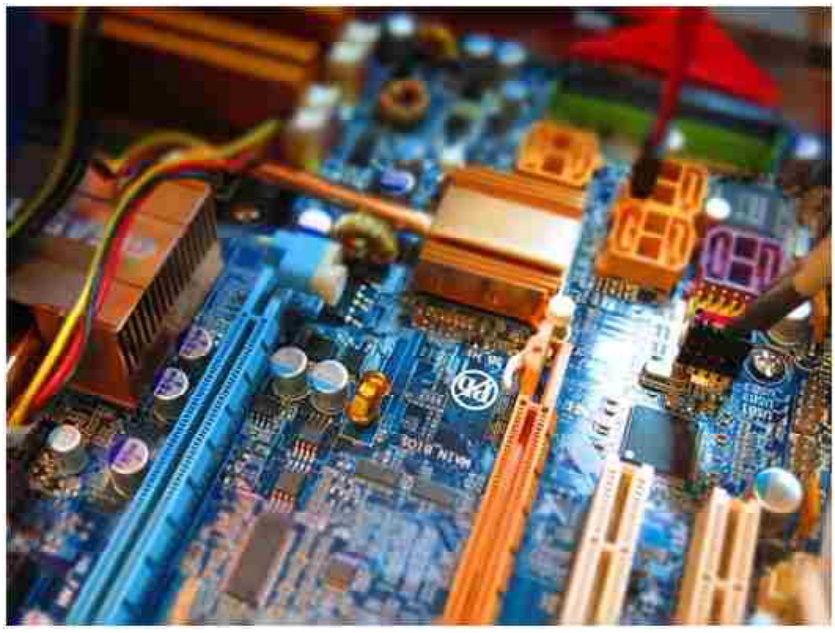
1.0 LEARNING OBJECTIVES :

- The meaning of Information System and its requirement
- Advantages and use of Information system
- How to take customer feedback and expectation

1.1 INTRODUCTION :

Information has become a key to all businesses. It is necessary for big corporate house and even small business enterprises also. We are talking of information from commercial point of view. Even we are using any information that is processed by third party (which we have never meet and seen) for us.

Before starting of this century data and information were handled manually. It is with the time and technology we have shifted our work on hardware and software. Surprisingly things have become so smooth and effective that we could save lot of resources which we can divert to earn more profits.



1.2 MEANING AND DEFINING OF INFORMATION SYSTEMS :

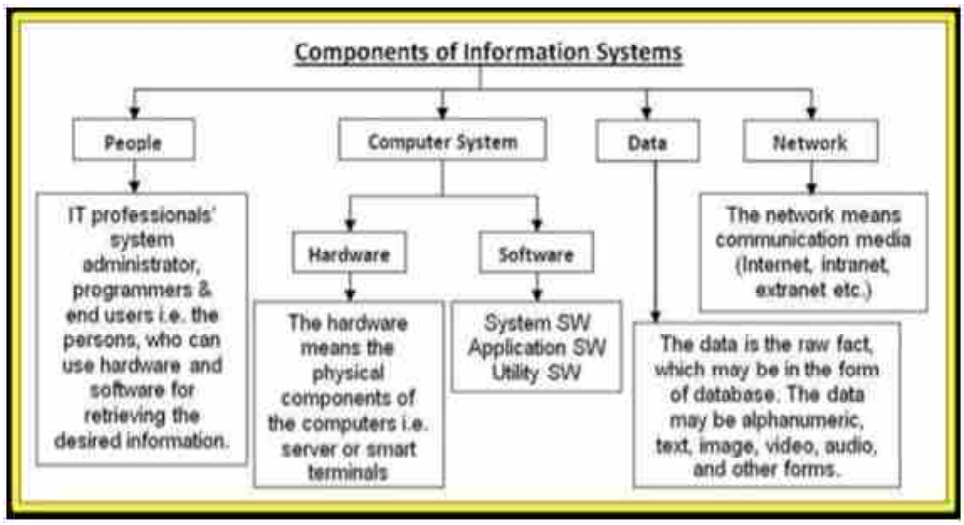
You may have come across the term Information System many times. But what exactly does that term mean ? Let's take a look at some of the more popular definitions from various sources :

"Information Systems (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data."

"Information Systems are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings."

As you can see, these definitions focus on two different ways of describing information systems : the components that make up an information system and the role that those components play in an organization.

The competitiveness of most companies is in a large degree based on the effective use of information technologies and information systems especially. The main purposes of information systems are to provide the right information to the right people at the right time. It is used to track, store, manipulate and distribute the information from gathered data to appropriate persons when necessary.



1.3 REQUIREMENT OF INFORMATION SYSTEM :

Requirement of information system is a description of the service that the software must offer. It describes a software system or its component. Requirement is nothing but inputs to the software system, its behaviour, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. These functional requirements are also called Functional Specification. Functional software requirements help you to capture the intended behaviour of the system.

Functional Requirements should include the following things **:**

- Details of operations conducted in every screen
- Data handling logic should be entered into the system
- It should have descriptions of system reports or other outputs
- Complete information about the workflows performed by the system
- It should clearly define who will be allowed to create/modify/delete the data in the system
- How the system will fulfil applicable regulatory and compliance needs should be captured in the functional document

1.3.1 Benefits of Functional Requirement :

The benefits of creating a typical functional requirement document–

- Helps you to check whether the application is providing all the functionalities that were mentioned in the functional requirement of that application
- A functional requirement document helps you to define the functionality of a system or one of its subsystems.
- Functional requirements along with requirement analysis help identify missing requirements. They help clearly define the expected system service and behaviour.
- Errors caught in the Functional requirement gathering stage are the cheapest to fix.
- Support user goals, tasks, or activities

1.3.2 Types of Functional Requirements :

Here, are the most common functional requirement types

- Transaction Handling
- Business Rules
- Certification Requirements
- Reporting Requirements
- Administrative Functions
- Authorization levels
- Audit Tracking
- External Interfaces
- Historical Data Management
- Legal and Regulatory Requirements

1.4 ADVANTAGES & DISADVANTAGES OF INFORMATION SYSTEM :

The information is absolutely important component for every business these days and its need is growing with time. It is becoming integral part of business operation and hence very advantageous. The advantages are :

1. **Communication :** With the help of information technologies the instant messaging, emails, voice and video calls becomes quicker, cheaper and much efficient and we are able to exchange our thought instantly.
2. **Globalization and Cultural Gap :** by implementing information systems we can bring down the linguistic, geographical and some cultural boundaries. Sharing the information, knowledge, communication and relationships between different countries, languages and cultures becomes much easier.
3. **Availability :** An Information system has made it possible for businesses to be open 24 × 7 all over the globe. This means that a business can be open anytime anywhere, making purchases from different countries easier and more convenient. It also means that you can have your goods delivered right to your doorstep with having to move a single muscle.
4. **Creation of New Types of Jobs :** One of the best advantages of information systems is the creation of new and interesting jobs. Computer programmers, Systems analyzers, Hardware and Software developers and Web designers are just some of the many new employment opportunities created with the help of IT.
5. **Cost Effectiveness and Productivity :** The IS application promotes more efficient operation of the company and also improves the supply of information to decision–makers; applying such systems can also play an important role in helping companies to put greater emphasis on information technology in order to gain a competitive advantage. IS has a positive impact on productivity, however there are some frustrations can be faced by systems users which are directly linked to lack of training and poor systems performance because of system spread.

There are very few disadvantages of information system as well and we must know them as well. The disadvantages are :

1. **Job Loss and Uncertainty :** Implementing the information systems can save a great deal of time during the completion of tasks and some labour mechanic works. Most paperwork's can be processed immediately, financial transactions are automatically calculated, etc. As technology improves, tasks that were formerly performed by human employees are now carried out by computer systems. For example, automated telephone answering systems have replaced live receptionists in many organizations. One has to be in a constant learning mode, if he or she wishes for their job to be secure.
2. **Dominant Culture :** While information technology may have made the world a global village, it has also contributed to one culture dominating another weaker one. For example it is now argued that US influences how most young teenagers all over the world now act, dress and behave. Languages too have become overshadowed, with English becoming the primary mode of communication for business and everything else.

3. **Security Issues :** Thieves and hackers get access to identities and corporate targeting sensitive company data. Such data can include vendor information, bank records, intellectual property and personal data on company management. For example, several retail chains were targeted recently by hackers who stole customer information from their information systems and distributed Social Security numbers and credit card data over the Internet.

4. **Installation Expenses :** To integrate the information system it require pretty good amount of cost in a case of software, hardware and people. Software, hardware and some other services should be rented, bought and supported. Employees need to be trained with unfamiliar information technology and software.

Information systems contribute to the efficient running of organizations. Information systems are showing the exponential growth in each decade. Today's information technology has tremendously improved quality of life. Modern medicine has benefited with better information system using the latest information technology. By understanding and learning what advantages and disadvantages it can bring, we have to try, believe and put an effort with our best to make that existing advantage much better and navigate the disadvantages to have a less impact on organizations and society.

1.5 CUSTOMER FEEDBACK & EXPECTATION :

If you run your own business, it is understood that you will do your best to please your customers, satisfy their needs, and eventually to keep them loyal to your brand. But how can you be sure that your efforts are bringing desired results ? Therefore it is very important to know about customer experiences and opinion they have for your brand. It is helpful information that you can use to adjust your business to fit their needs more accurately for your customers.

To know about customer experiences you have to get customer feedback. There are plenty of ways you can pull customer feedback and get benefitted from this. Collecting customer feedback, whether prompted or unprompted, is crucial in managing customer satisfaction and loyalty, in customer retention, improving products and services, and in many more areas of business.

Customer feedback is information provided by clients about whether they are satisfied or dissatisfied with a product or service and about general experience they had with a company. Their opinion is a resource for improving customer experience and adjusting your actions to their needs. This information can be collected with different kinds of surveys (prompted feedback), but you can also find opinions and reviews your clients post online (unprompted feedback) and collect them using Internet monitoring tools. Both sources are important to get a full picture of how your clients perceive your brand.

Companies understand an important role that customer feedback plays in business. They consistently listen to the voice of their clients. Not only they search for opinions they clients publish on social media and reviews they provide on websites designed for gathering feedback, e.g. TripAdvisor, but they also deliberately ask for feedback using distinct kinds of surveys. If you want to stay ahead of competition you should never stop listening to customer feedback whether it is positive or negative, prompted or unprompted.

Here are the top seven reasons why customer feedback is important in business.

1. **It helps improve products and services :** When you initially introduce a new product, brand or service to market you probably have an idea about customer needs. Market research that you conduct before introduction gives you an idea if potential customers would be willing to buy it and also they can give you some tips on how you could improve it. However, only after your customers use your product or service you can learn about all the advantages, flaws and their actual experience.

2. **It helps you measure customer satisfaction :** Customer satisfaction and loyalty is a crucial factor that determines company's financial performance. It is directly linked to many benefits, such as increased market share, lower costs, or higher revenue. Naturally, the best way to find out if you meet their expectation is to get their opinions. Using rating–based questions you can easily estimate the level of satisfaction and consequently predict your company's financial condition in the future.

3. **Collecting feedback shows you value their opinions :** By asking your clients for feedback you communicate that their opinion is important to you. You involve them in shaping your business so they feel more attached to your company. Listening to their voice helps you create stronger relations with them. This is the best way to gain valuable brand ambassadors who will spread positive word–of–mouth for you. People always appreciate when you ask them if they are happy (or unhappy) with your service. It shows you actually value their opinion and that you are here for them, not the other way around.

4. **It helps you create the best customer experience :** Today's marketing is heavily based on experiences people have with products, services and brands. They do not buy Apple products just because they are good. They want to demonstrate their status and affiliation to a particular group. They do not buy Nike clothes because they are durable. They buy courage to extend their boundaries. Therefore, if you focus on providing the best customer experience at every touch point clients will stay loyal to your brand.

5. **It helps to improve customer retention :** Satisfied customer will stay with you. Unhappy customer will eventually find a better alternative to your business and leave. Customer feedback helps you determine if your clients are satisfied with your service and detect areas where you should improve. This is to win a client back and even increase his level of loyalty.

6. **It is a reliable source for information to other consumers :** In the times of social media, consumers do not trust commercials or expert advice so much. Opinions provided by other customers who have already used a product or service are more reliable source for information these days.

When you look for an accommodation in a city you visit or you want to find a nice new restaurant to have dinner with friends you read reviews beforehand.

7. **It gives you data that helps taking business decisions :** There is no place for business decisions based on loose guesses on a highly competitive market. Successful business owners gather and manage distinct kind of data that helps them develop future strategies. Only in this way they are able to adjust their products and services to perfectly fit customer needs.

Customer feedback is one of the most reliable sources for tangible data that further can be used in taking business decisions. Customer insights will help you understand clients and their needs more profoundly.

Needless to say, a client feedback system is designed to help (and sometimes encourage) customers to share their thoughts and opinions about a particular company, product or service. It is internet based so there is no way it could backfire right ? This, in turn, allows companies to gather data about their customer's demographics, buying habits, preferences and many more, all of which can then be analyzed and used to create a more effective marketing strategy for optimizing sales.

❑ **Check Your Progress :**

1. In last century information where handled _____ majorly
   (a) Manually (b) Electronically
   (c) (a) and (b) options (d) None of the above options
2. Information systems are combination of Hardware, software and _____ networks
   (a) Human (b) Manager
   (c) Telecommunication (d) CEO
3. Functional requirement of information system is to support user goals, tasks or activities.
   (a) Correct statement (b) Incorrect statement
   (c) Statement is incomplete (d) None of the above options
4. Which is not type of functional requirements ?
   (a) Transactional Handling (b) Customer Finance Handling
   (c) Audit Tracking (d) Historical Data Management
5. Which is not an advantage of information system ?
   (a) Availability (b) Faster communication
   (c) Create Cultural Gap (d) Cost Effective
6. Which is not disadvantage of information system ?
   (a) Job loss (b) Dominant one culture
   (c) Security issue (d) Cheaper to install
7. The best way to improve existing product is _____.
   (a) to know customer expectation (b) to get right feedback
   (c) to do market research (d) All of the above options

8. Customer feedback helps us to :

(a) give best customer experience (b) measure customer satisfaction

(c) improve customer retention (d) All of the above options

1.6 LET US SUM UP :

Information Systems are interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization.

Aside from gathering customer data, a customer feedback system may also be used as a tool for customer outreach. Feedback boxes and surveys, for example, allow clients and customers to share their thoughts and opinions about your company's services, and this can be considered as one of the best examples of customer engagement. A customer feedback system not only allows your businesses to better understand their clients, they are useful tools for research and customer engagement. When you purchase one of these devices, you are not just buying a survey tool you are also buying a versatile system that can optimize the effectiveness of your company's marketing strategy.

1.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. (a), 2. (c), 3. (a), 4. (b)

5. (c), 6. (d), 7. (d), 8. (d)

1.8 GLOSSARY :

Data : Raw facts and figure for the use of analysis and interpretation.

Information : knowledge obtained from investigation, study, or instruction.

System : A set of ideas or rules for organizing something or a particular way of doing something.

Feedback : Information or comments about something that you have done which tells you how well or bad it is done.

1.9 ASSIGNMENT :

1. Write the advantages of information system and explain them.
2. Discuss in detail the use of customer feedback in service industry
3. How information systems are has become backbone of corporate houses ?

1.10 ACTIVITIES :

1. Study about a information system in any company of your choice. Find out the major components of it.
2. What feedback system is used by airline companies ? Enlist and explain at–least 3 of them.

1.11 CASE STUDY :

❖ **Walmart :**

With the advent of science and technology, technological innovations have become a pre–requisite to achieve operational and strategic excellence. Organizations by using state–of–the–art systems, are striving for their best to

achieve sustainable and long–term competitive advantage. It has become sine qua non to use modern tools for the effective achievement of goals and objectives. Its importance can also be observed from the increased spending on Research & Development in order to pace up with the today's dynamic business environment.

Wal–Mart, founded by Sam Walton in 1962, is the world's largest retailer that employs about 2.1 million associates worldwide, in more than 8,400 stores, including 8, discount stores, 3,100 combination discount and grocery stores. Wal–Mart is serving its customers and members more than 200 million times per week at more than 8,613 retail units under 55 different banners in 15 countries. Wal–Mart has ranked first among retailers in Fortune Magazine's 2010 Most Admired Companies survey with fiscal year 2010 sales of $405 billion. Sam Walton's belief was to build an empire by providing value to its customers and empowering employees, also known as associates. The way the Wal–Mart operates is so fascinating and impressive that Jack Welch, CEO of General Electric once said : "Many of our management teams spent time there observing the speed, the bias for action, the utter customer fixation that drives Wal–Mart."

The use of high–tech Information technology has always been an essential ingredient for Wal–Mart's growth. Since its inception, it has used the IT systems well enough for the Inventory, administrative, customers and suppliers management.

Wal–Mart's investment in technology started with the computerized accounting systems and since then the continuous adoption of latest technologies has made Wal–Mart a market leader in the whole retail industry.

Wal–Mart developed a well–equipped computerized Point of Sale (POS) system capable of identifying each unit sold, creation of accurate sales receipt and storing all the information item–by–item for sales analysis and inventory reordering purposes. It helped company to avoid overstocking of merchandize through effective information usage and also assisted them in investing in only those merchandize that were profitable. It has also helped them figure out best selling products and prospective products that customers want. Analysts say that it is Wal–Mart's Point of Sale system that has helped them achieve the world's largest market share and revenues in retail industry.

Wal–Mart, in 2004, was the first in retail industry to adopt electronic radio frequency identification (RFID) tags for inventory distribution management. RFID technology, which is still being used, helps them keep track of inventory movement across its supply chain. Wal–Mart was trailing K–Mart in 1980's but with the adoption of latest technologies, it has now become the trend setter in retail industry all over the world.

Wal–Mart is currently working on a project to make best out of wireless technology. In near future, they have plans to develop a remote system that would allow customers to just walk into their store and use their own devices (Phones or PDA's) to get whatever they want. i.e. they might go online to their website, while at the store, and find things for themselves or just compare the products' prices etc.

Customer service, best shopping environment and experience, one–stop shopping, best value products, customer convenience of online shopping, good customer relations are the blessings that Wal–Mart provides using cutting–edge technology. Latest wireless system at their stores, online web–retailing, vast width and hierarchy of product items, and stores at multiple remote sites are the benefits customers of Wal–Mart cherish.

Wal–Mart is considered to be a trend setter in retail industry and it's all due to its inclination towards achieving impossible through modern technology. For example, Wal–Mart once tried to develop three experimental stores in McKinney, Aurora and Las Vegas that were equipped with latest technologies or concepts like wind turbines, photovoltaic solar panels, bio–fuel–capable boilers and water–cooled refrigerators. Irrespective of the criticism it had on environmental issues, Wal–Mart's initiative was considered to be a positive step towards change and innovation and it provided them with an opportunity to become the biggest seller of organic milk and the biggest buyer of organic cotton in the world, as well as reducing packaging and energy costs. It has been quoted in 2006's annual report of Wal–Mart that in order to compete against upscale and appealing store, such as 'Target', they have launched a new Supercenter concept in Plano, Texas. The new store had wood floors, wider aisles, a sushi bar, a coffee shop with free Wi–Fi Internet access, and more expensive beers, wines and other electronics goods.

By using advance forecasting techniques and integrating different technologies, Wal–Mart is planning to deploy simulation software that would help them simulate business events that are yet to happen.

Wal–Mart has got a strategic plan of introducing a concept of self–service. Self–service technology, aimed at eliminating paper and paper forms, will be provided to their associates, prospective associates, customers and members. It was said by Kevin Turner, CEO of Wal–Mart's subsidiary corporation, in his interview with 'CIO' personnel that "having an associate portal and devices on our sales floors will let customers and members get product information, and let us do computer–assisted selling".

For evaluating new technologies, they are always plugged into research and development labs of their key suppliers like Cisco, IBM, NCR, AT&T or HP in order to get current with latest technologies and drive the future for themselves.

Wal–Mart has been outstanding in its investments in Information technology from all prospects. IT systems at Wal–Mart allow them to reduce transactional as well as operational costs at their distribution centres and it has also helped them to support Wal–Mart's long–term strategy of owning the distribution centres and maintaining long–term relationships with their suppliers. Also, improvement in productivity due to IT systems is dramatic at Wal–Mart. It has helped them offer products at such a nominal cost that a small town merchant is unable to provide and this is remarkable achievement of Wal–Mart. It has become a sustainable competitive advantage for them over their competitors and a reason of their growth and profitability. We are aware of a fact that every benefit is accompanied with some problem but Wal–Mart has successfully defied its weaknesses and have used its strength well to take advantage from the prospective opportunities and avoiding possible threats.

1.12 FURTHER READING :

1. Management Information System by C. Laudon Kenneth & P. Laudon Jane, Pearson Education Publisher
2. Management Information System by Gagan Varshney, Pankaj Madan & Avdhesh Gupta, Global Academic Publishers & Distributors

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UNIT 02

Flight Catering Information System

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES :

- Information Flow in System
- Operation on Information Flow
- Barrier in Flow of Information

2.1 INTRODUCTION :

In an theoretical context information flow is the transfer of information from one variable to another variable in a given process. Not all flows may be desirable; for example, a system should not leak any secret (partially or fully) to public observers.

Information can flow in four directions in an organization : downward, upward, horizontally, and diagonally. The size, nature, and structure of the organization dictate which direction most of the information flows. In more established and traditional organizations, much of the communication flows in a vertical–downward and upward–direction. In informal firms, such as tech start–ups, information tends to flow horizontally and diagonally. This, of course, is a function of the almost flat organizational hierarchy and the need for collaboration. Unofficial communications, such as those carried in the company grapevine, appear in both types of organizations. There are 4 directions of flow of information :

1. **Downward Communication Flows :** Downward communication is when company leaders and managers share information with lower–level employees. Unless requested as part of the message, the senders don't usually expect (or particularly want) to get a response. An example may be an announcement of a new CEO or notice of a merger with a former competitor.

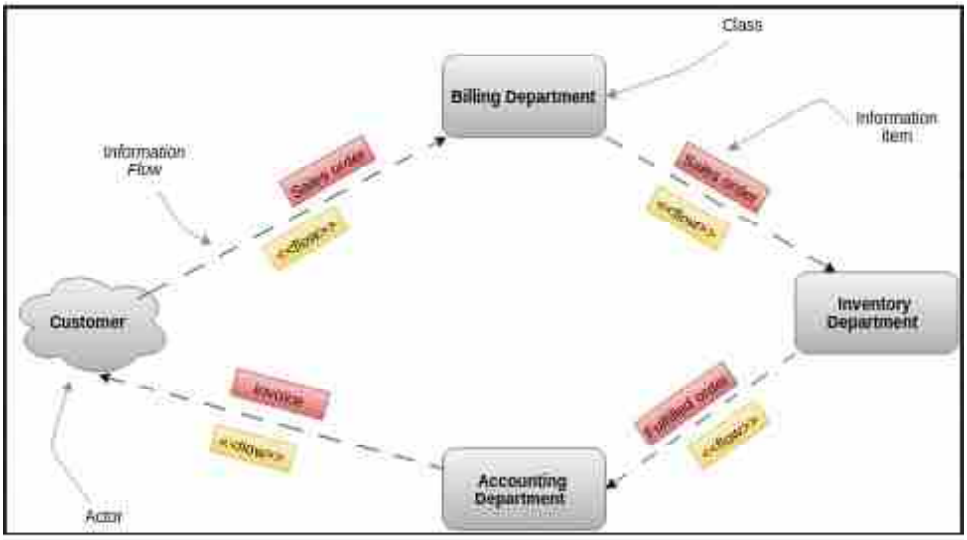
2. **Upward Communication Flows :** Information moving from lower–level employees to high–level employees is upward communication (also sometimes called vertical communication). For example, upward communication occurs when workers report to a supervisor or when team leaders report to a department manager. Items typically communicated upward include progress reports, proposals for projects, budget estimates, grievances and complaints, suggestions for improvements, and schedule concerns.

3. **Horizontal and Diagonal Communication Flows :** It involves the exchange of information across departments at the same level in an organization (i.e., peer–to–peer communication). The purpose of most horizontal communication is to request support or coordinate activities. People at the same level in the organization can work together to work on problems or issues in an informal and as–needed basis. The manager of the production department can work with the purchasing manager to accelerate or delay the shipment of materials.

4. **Diagonal communication :** It is cross–functional communication between employees at different levels of the organization. For example, if a sales representative e–mails the vice president of marketing, then diagonal communication has occurred. Whenever communication goes from one department to another department, the sender's manager should be made part of the loop.

Peter Checkland, a British Management Scientist, described information flows between the different elements that compose various systems. He also defined a system as a "community situated within an environment".

The Information Flow Diagram (IFD) is so that sources that send and receive information can be displayed neatly and analysed. This allows viewers to see the forwarding of information and the analysis of different situations. The creation of an IFD is, in most cases, the first step in information analysis.



IFDs are behaviour diagrams that show the exchange of data between systems. They are also used to describe the circulation of information within systems. Information that moves along the diagram is represented as either information items or by concrete classifiers. IFDs are used to :

- Develop a high level overview of the flow of information in an organisation.
- Highlight detailed flows in an individual task.
- Describe the flow of information inside and around organisations and between departments.
- Understand business process bottlenecks in sequential, deferred, real–time, parallel, wheel, one–to–many, many–to–many and many–to–one–to–many information flows.

2.2 INFORMATION FLOW IN SYSTEM :

Information flow is the movement of information between people and systems. Efficient and secure information flows are a central factor in the performance of decision making, processes and communication.

The following are common types of information flow.

1. **Publish/Subscribe :** Data integration is often implemented as a publish/ subscribe model whereby a data producer publishes a notification of data changes and interested subscribers pick it up. For example, a sales system publishes a new customer and a number of systems including the billing system add the customer to their data base.
2. **Push :** Data integration that is pushed from one system to another such as a sales system that pushes new customer to a billing system is called push system of information flow.
3. **Pull :** System that pulls data from a single source of truth is pull system of inflow of information. The example is a billing system that doesn't store basic customer information but uses as API offered by a sales system to access customer records.
4. **Choreography :** A method of implementing processes whereby services are aware they are participating in a process but there is no central controller of the process. For example swarm robots that are putting up a beach umbrella may communicate amongst each other to get the job done

with no boss controlling things. This result in complex, dynamic and often redundant information flows.

5. **Orchestration :** A method of implementing processes that relies on a central controller, for example, robots that are putting up a beach umbrella who don't move unless the boss tells them too. This results in relatively easy to model information flows that flow from the controller out.
6. **Event Handling :** Information that is published to an event handler and handler decides where the event information needs to flow. This is associated with a technology known as complex event processing that can look for patterns in streaming events to find things that require action. For example, if someone pulls a fire alarm the handler might wait for smoke detector before confirmation before triggering a sprinkler system.
7. **Communication :** Information that flows via human communication such as a business email is communication. This is typically dynamic but can also be modelled in term of processes and procedures that people follow.
8. **Knowledge :** The flow of information is created by humans such as documents. Example can be workflow for document approval in a knowledge management system.

2.3 INFORMATION FLOW OPERATION :

Operational excellence in information flow is when each and every employee can see the flow of value to the customer, and fix that flow before it breaks down.

Flow impacts everything from operations to customer experience. Flow in the office means information always moves forward to the customer in progressive steps, starting with its point of entry into the organization and finishing when the completed work or service is delivered to the customer. Having robust flow in the office also means information doesn't stagnate, scatter throughout the organization, or move backward in loops to correct errors or supply missing data.

The most important aspects of flow are timing. This means everyone always knows when information will be completed and when it will flow from one process to the next. With each process connected in flow, and with the timing of each flow known, we create a guaranteed turnaround time for the flow of information in the office.

Leaders should create a designed intentional flow in order to establish a standard. Normal flow tells us not only the path of the flow and the timing of it, but also the amount of information allowed being in the system at any one time. Abnormal flow is any instance where the flow has deviated from its normal, expected operation.

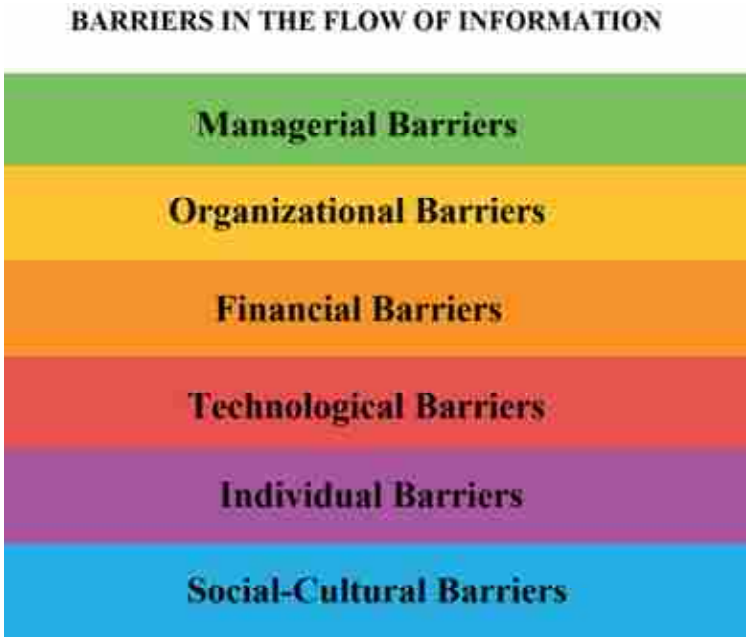
2.3.1 Overcoming Challenges of Flow in the Office :

The process of pursing operation cannot be without hurdles. One of the main challenges with creating or sustaining flow in the office is that teams tend to rely on information that is buried in systems that they have to search for and retrieve. In a modern digital workplace, we typically monitor information and its status and then present the status in management meetings. This equips organizations and teams to move towards proactively managing flow. In operation we want to know where the information should be, and the way we accomplish this is by designing a flow of information with timing throughout the organization

and creating visuals to signal normal and abnormal flow. The information and its status from our digital systems and puts it out in the physical office for everyone to understand, thereby creating employee ?level ownership of the work. Keep this ownership at the employee level also and not just the management level. It is critical to sustaining the flow created in the office ensuring customers remain satisfied both now and as well as in the future.

2.4 BARRIERS IN THE FLOW OF INFORMATION :

In order to facilitate information sharing in the supply chain for achieving desired goals the major barriers to information sharing have to be studied in detail. The information on the barriers to information sharing in industrial enterprises must be studied to facilitate the managers and to understand the cost associated with these barriers. These barriers have been categorized into six perspectives as presented below :



1. **Managerial barriers :** These barriers arise because the managers dealing with supply chain do not realize the real benefits of information sharing and do not have confidence in information sharing system. These senior executives do not wish to invest in innovation and culture, conducive to information sharing. Lack of leadership and managerial direction for information sharing makes the implementation of information sharing extremely difficult. In order to achieve information sharing culture, support of senior management is required. The emphasis should be given on co–ordinated managerial guidance rather than imposing the hierarchy of top to down leadership. Lack of training and experience and low literacy about the new technology is also considered as one of the barrier of information sharing. Training and ongoing support with clear guidelines are prerequisite for effective information sharing on all the levels of organizations. Lack of trust makes it difficult to share sensitive information because supply chain managers feel that they cannot afford to share sensitive proprietary information without ensuring that how other members of the chain will protect it from misuse. Past experience of opportunistic behaviour of the supply chain members in using the information create hesitation to share the information.

2. **Organizational barriers :** Organizational barriers are categorized as those barriers that are originated from attitudes of the organizations towards the implementation of information sharing. These barriers are due to the organizational structure and the groups involved in an information sharing. The process of information sharing may become complicated because of organizational barriers. Information sharing initiatives require radical changes in process and behaviour of individuals as well as organizations. Normally the organizations and individuals resist the changes because of structural conflicts and managerial practices of different organization in supply chain. The delay to address these embedded barriers lead to disappointment and failures. Organizational factors that are deeply embedded in institutional and professional realities also create barriers to inter–organizational information sharing. The organizations with centralization in strong hierarchical structure have a significant negative impact on sharing of information in a supply chain. The interests of employees to share information are greatly reduced when they do not enjoy the freedom due to limited autonomy and when they are required to seek permission from their superior for every decision. The horizontal department in bureaucracy could also constitute barriers for information sharing. The complexity of information sharing gradually increases from the organizational level to the inter–organizational level. Small to medium organizations associated in supply chain feel that information sharing is suited only to big companies and that it is an additional financial burden that will not bring any major returns on investment to their businesses.

   The formal rules, guidelines, procedures and regulation could be some barriers to information sharing as well. Less formalized organization structure and voluntary information sharing arrangements can lead to more flexible and open interactions among employees and seem to create more beneficial environment for information sharing in supply chain.

3. **Financial barriers :** Financial constraints are a key barrier to information sharing in supply chain. Cost considerations are the prime challenges to support the infrastructure and man–power requirements of information system. Information and technological systems require more funds because without this efficient information sharing cannot take place in supply chain. Large amount of financial resources are needed for redesigning internal organizational and technical processes, changing traditional and fundamental product distribution channels, customer service procedures and training of staff to achieve efficient information sharing in supply chain. Lack of resources inhibits organizations to adopt information sharing using information technology. It is because of difficulties in raising finance to invest in information sharing systems

   Implementation of transparent information sharing system becomes very expensive in supply chain with many members. Most chain members such as retailers show unwillingness to invest in sophisticated infrastructure for using information technology tools for the purpose of ordering and business processing. The financing of feasibility studies, systems design and management efforts to start up new supply chain communication channels becomes a substantial barrier to implement the efficient information sharing system regarded the high initial investment and running cost of maintenance of an information sharing system in supply chain as financial

barriers. The cost of specialized man–power and training of personnel becomes obstacle to information sharing in the system. Initial setup cost as one of the major barrier for information sharing system. Most of the small to medium organizations do not have sufficient finances to employ consultants to help the implementation of information sharing systems.

4. **Technological barriers :** The advancement of information technology has increased the ease of information sharing and has provided better methods to share and integrate information. Technological linkages across organizational units as well as up and down the supply chain are particularly critical to sharing information. Complexity of a technology is a major factor that affects the adoption of information sharing. Different organizations may use various types of hardware, software, data standards and definitions, as well as programming languages and the task of integrating them could be very challenging. The technological factors can cause the failure of any information system in supply chain so that technological barriers need to be tackled at the earliest. If the technology is simple to use, it is easier to adopt and other characteristics such as functionality, reliability and accessibility influence the users to use the technology for information sharing. Poor IT infrastructure is one of the barriers in the supply chain integration. However, poor IT infrastructure may be attributed to lack of funds and lack of awareness and commitment of top management about the use of IT tools in a supply chain. The deployment of IT tools in a supply chain is also not free from barriers. Some of these barriers are due to lack of trust in information technology tools, fear of information system breakdown etc. Differences in level of the technological capabilities of chain members may be an important barrier in participation in inter–organizational information systems. Lack of ability of professionals to maintain adequate levels of knowledge and expertise due to fast pace of rapidly and radically changing technology used in information sharing system is one of the major barrier of information sharing.

5. **Individual barriers :** Barriers originating from behaviour and actions of either individuals or groups within or between various business functions are considered individual barriers. Information is scattered among individuals and across groups or among group members. The information that other chain members might need may be available with any of individual or group in the chain. Organizations' effort to encourage and facilitate the sharing of information by investing in collaborative information and communication technology becomes useless if employees are not willing to share the information. They have also stated that individuals are more willing to share information when they are happy in their organizations and unsatisfied individuals always hesitate or refuse to share information. They have suggested that it is important to explore people's attitudes toward sharing information and to see whether there are significant factors that can influence people's attitudes.

   Many employees are reluctant to share and contribute their own information to shared databases. Some individuals may feel that they are already having existing overload of information sharing. Information overload is described as having more relevant information than one can assimilate. Information overload can even worsen the effectiveness of decisions because more information sometimes only confuses and distracts the decision maker. One

of the major barriers for sharing information is lack of motivation that can lead to many different hindrances. Individuals feel that power, ownership and privilege of possessing crucial information are lost when they share the information. Some employees regard information as a symbol of power. Sharing information is viewed as losing power and social influence. These factors inhibits information sharing and can result in something that has termed as information pathologies e.g. preservation of information from co–workers to show superiority. Training as one of the barriers in sharing information.

6. **Social–Cultural Barriers :** Misinterpretation or misuse of shared information as one of the barriers of inter–organizational information sharing. The proprietary information shared with collaborators may be either intentionally or unintentionally revealed to competitors. Lack of coherence between the personal intents of employees and the organization missions as one of the barriers to information sharing. One of the major barriers to information sharing is the failure to recognize the cultural gap between different stakeholders within an organization. Working methods, techniques and corporate culture may vary from organization to organization and this may become a barrier of information sharing in supply chain.

   The information culture within an organization must be conducive to information management. This means a culture that secures the support, enthusiasm and co–operation of staff and management alike. Low level of technological literacy of some participating individuals and supply chain members is also treated as another barrier for implementing information sharing. There may be difference of opinions among different departments due to differences in their working style. Lack of harmonious environment and lack of commitment/involvement of employees is also a major social barrier for information sharing in supply chain. Information sharing can be promoted through cultural norms within the organization, on an organizational basis as well as on departmental basis. Employee's perceptions on organization's cooperativeness and the fairness of organizational procedures have a significant effect on their willingness to share information at the workplace.

❑ **Check Your Progress :**

1. Information flow is in _____ directions in an organisation

   (a) 2 (b) 3 (c) 4 (d) 5

2. In informal firm information also flow _____ and _____.

   (a) East to West (b) Up and Down

   (c) End to End (d) Horizontally and Diagonally

3. Which is not example of downward communication ?

   (a) CEO to Senior Managers

   (b) Supervisor to workers

   (c) Sales Manager to Vice President Sales

   (d) None of the above options

4. Which is not type of Upward Communication ?
   (a) Sales Executive to Branch Manager
   (b) Supervisor to Duty Manager
   (c) CEO to Senior Manager
   (d) None of the above options
5. The type of information flow is/are
   (a) Push (b) Pull
   (c) Both options (a) and (b) (d) None of the above options
6. The most common aspect of flow is _____.
   (a) Timing (b) Routine (c) Data (d) Organisation
7. The operational flow of information checks the flow and fixes that flow before it breaks down.
   (a) Incorrect Statement (b) Correct Statement
   (c) Statement Vague (d) None of the above options
8. Barrier to information flow are :
   (a) Managerial (b) Organisational
   (c) Individual (d) All of the above options
9. Lack of harmonious environment and commitment create _____ barrier
   (a) Managerial (b) Organisational
   (c) Individual (d) Socio–cultural
10. Poor IT infrastructure is _____ barrier
   (a) Technological (b) Organisational
   (c) Individual (d) Socio–cultural

2.5 LET US SUM UP :

Information flow is simply the movement of information from one point to another, over time. One way to think of it is as an assembly line. Raw material enters the system, usually as data. It is assembled into information and, at times knowledge, and is then moved to a storage facility.

Flow is a powerful and fundamental concept in operation because it serves as an indication of how the organization is functioning. It enables everyone, not just management, to see when flow has stopped or when we are no longer on time to deliver the service provided by the office.

2.6 ANSWERS FOR CHECK YOUR PROGRESS :

1. (c),	2. (d),	3. (c),	4. (a),	5. (c)
6. (a),	7. (b),	8. (d),	9. (d),	10. (a)

2.7 GLOSSARY :

Operation : Operations are the business activities that a firm engages in to convert materials into finished products or services, sell them to customers, and earn a profit.

Supply Chain : The series of processes in the production and distribution of goods, from when they are first made, grown, etc. until they are bought or used.

Technology : The scientific knowledge and/or equipment that is needed for a particular industry, etc.

2.8 ASSIGNMENT :

1. Define the term Information Flow. Explain the term with the help of an example.
2. What are barriers in flow of information, explain its type ?
3. How to overcome the challenges of flow ?

2.9 ACTIVITIES :

1. Visit a travel company in your locality and interview one of its staffs and inquire what barrier the face while communicating information to customer.

2.10 FURTHER READING :

1. Management Information System by Gupta A.K., S Chand & Company Publisher
2. https://scialert.net/fulltext/?doi=ijmsaj.2011.9.29
3. Management Information System by P. Mohan, Himalaya Publishing House Publisher

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UNIT 03

Information Integration System

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- Control on information and its scheduling
- Issues related to information system
- Market segmentation of information and management

3.1 INTRODUCTION :

Information Integration (II) is the merging of information from heterogeneous sources with differing conceptual, contextual and typographical representations. It is used in data mining and consolidation of data from unstructured or semi–structured resources. Typically, information integration refers to textual representations of knowledge but is sometimes applied to rich–media content. Information fusion, which is a related term, involves the combination of information into a new set of information towards reducing redundancy and uncertainty.

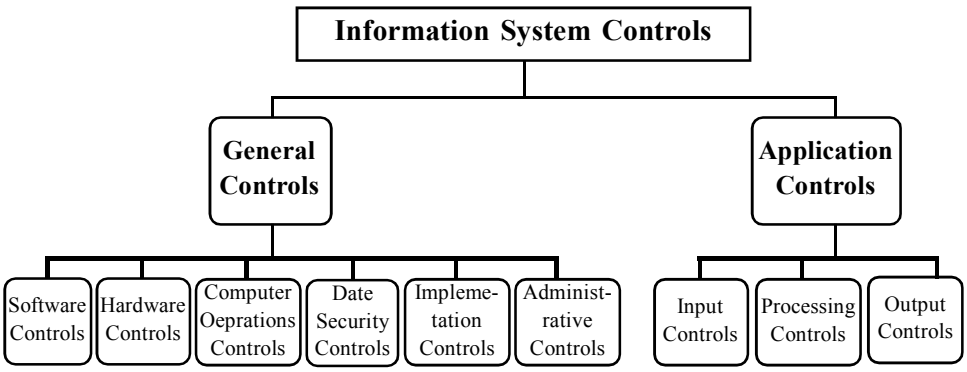
3.2 THE USE OF FULLY INTEGRATED INFORMATION SYSTEMS :

Technologies available to integrate information include duplication, and string metrics which allow the detection of similar text in different data sources by fuzzy matching. We have certain use of fully integrated information system. They are as flows :

1. **Real Time Data :** Through having integrated information in one system, all of the data is up to date. This is essential for all elements of the organisation ranging from marketing communications through to finance.
2. **Better Communication :** Team members will be able to communicate better through having exactly the same information available to them at each time. It saves vital energy and time having to mismatch data between systems and departments.
3. **Reduced Risk of Errors :** Due to the fact that data will not have to be replicated, there is less chance of human errors being made which leads to more accurate information available.
4. **Greater Productivity :** Employees can spend more time on tasks that will help the business to grow, rather than having to replicate data and wait for information to be sent to them from other departments.
5. **One Secure Location :** Through having all of the necessary data stored in one information system, relevant data is easier for employees to access. Many leading business systems allow restrictions on what individual employees are allowed to access so sensitive information can be seen only by those who need it.

3.3 INFORMATION SYSTEM CONTROLS :

Information Systems controls are a set of procedures and technological measures to ensure secure and efficient operation of information within an organization. Both general and application controls are used for safeguarding information systems.



3.3.1 General Controls :

These controls apply to information systems activities throughout an organization. The most important general controls are the measures that control access to computer systems and the information stored or transmitted over telecommunication networks. General controls include administrative measures that restrict employee access to only those processes directly relevant to their duties, thereby limiting the damage an employee can do. Some general controls are as follows.

1. **Software Controls :** Monitor the use of system software and prevent unauthorized access of software programs, system failure and computer programs.
2. **Hardware Controls :** Ensure the computer hardware is physically secure and check for equipment malfunctions. Computer equipment should be specially protected against extreme temperatures and humidity. Organizations should make provisions for backup or continued operation to maintain constant service.
3. **Computer Operations Controls :** This include controls over setup of computer processing jobs and computer operations and backup and recovery procedures for processing that ends abnormally.
4. **Data Security Controls :** Ensures critical business data on disk and tapes are not subject to unauthorized access, change or destruction while they are in use or in storage.
5. **Implementation Controls :** Audit the system development process at various points to ensure that the process is properly controlled and managed.
6. **Administrative Controls :** Formalize standards, rules, procedures and control discipline to ensure that the organization's general and application controls are properly executed and enforced.

3.3.2 Application Controls :

Application controls are specific to a given application and include measures as validating input data, regular archiving copies of various databases, and ensuring that information is disseminated only to authorized users. This can be classified as input, processing and output controls.

1. **Input Controls :** Input controls check data for accuracy and completeness when they enter the system. There are specific input controls for input authorization, data conversion, data editing and error handling.
2. **Processing Controls :** Processing controls establish that data are complete and accurate during updating. Run control totals, computer matching, and programmed edit checks are used as processing controls.
3. **Output Controls :** Output controls ensure that the results of computer processing are accurate, complete and properly distributed.

3.4 SCHEDULING OF INFORMATION FLOW :

Computerized scheduling allows users to publicly share free time on their calendars, while keeping specific appointments private. They tend to be more efficient than manual scheduling, but a good appointments secretary can more effectively handle some situations. Computerized scheduling systems are a method of using scheduling algorithms and rules to help multiple people manage appointments and meetings.

The pen–and–paper method is the old way of scheduling appointments for a workgroup, in which all scheduling is funnelled through an appointments secretary with a central calendar. In this model, the people whose time is being booked must check in regularly to find out what their schedule is, and to let the secretary know what times are unavailable. With large workgroups or very busy schedules, this system can rapidly become untenable.

Computerized schedules work very well only when all participants are committed to keeping their calendars current. When some users of the system are unaware of how to keep their calendars up–to–date, the system can fall apart. For example, in the doctor's office example above, if a doctor schedules an off–site appointment but fails to mark his travel time as unavailable, too much time will appear as available in the home office. In these cases, a combined method of computerization plus a competent appointments secretary can help keep things in order.

3.4.1 Benefits of Using a Scheduling System for Businesses :

Owning and running your own business is a huge undertaking. It can feel like there are a thousand things to do all at once on a daily basis. This can be true even if you have staff members to delegate some of the work to. So how do you keep track of everything on your "To do" list ? One way you can stay on top of everything is to use a scheduling system. There are at least 4 benefits of using a scheduling system in your business.

1. **Improves Time Management :** Scheduling systems are designed to help you keep on top of everything you need to get done. Rather than wasting valuable time writing and rewriting lists on a notepad one can develop a scheduling system.

   Online task management software quickly shows you what is on your list for each day and what is coming up in the near future. In addition, you can reassign projects to different days or even different staff members. This allows you to use more of your time getting stuff done and less just making lists and planning.

2. **Allows Prioritization of Tasks :** One of the benefits of using a scheduling system in your business is that you can set up tasks in order of priority. This allows you to focus on those tasks that are more important or have rigid deadlines first.

   Without using a software system you must keep track of deadlines and priorities on your own. That's not always easy when you're extremely busy and sometimes things get missed.

   It can also make you feel like you're buried beneath a mountain of work with not enough time to get it all done. As a result, your work quality could suffer which could draw customer complaints and loss of revenue.

3. **Enhances Efficiency :** You probably have a lot on your plate as a business owner and at times your schedule may change when you're not at work. Using a scheduling system in your business can help with that issue.

   One of the really cool features of most task management software systems is the ability to schedule and track projects on the go. Apps are available to install on your smart phone so you can make changes in real time as you need to.

   In addition, as your staff completes work assignments alerts can be sent straight to your phone to let you know. That's a more efficient way to keep track of work flow in your business than to call constantly and check in with employees.

4. **Strengthens Teamwork :** Another of the benefits of using a scheduling system in your business is that it strengthens teamwork. For example you

can assign a task to more than one person with instructions that they collaborate to complete it.

This type of task management allows employees to work together, communicate thoughts and ideas, and motivate each other. When team members draw closer together in their work it improves moral. It can even positively affect efficiency and productivity as well as the entire business environment.

It's certainly true that there are lots of things to do when you are a business owner. Rather than becoming overwhelmed, let the benefits of using a scheduling system in your business pave the path to success.

3.5 ISSUES RELATED TO INFORMATION SYSTEM :

Today's businesses run on technology. Every client interaction and internal process relies heavily on the computer systems that power everything. Management information system (MIS) is a general term to encompass the various technologies that exist in organizations today, as well as the personnel necessary to manage it all. Common problems include failure to strategize, meeting organizational needs, hiring and retaining good employees, staying current and integrating all your technologies.

1. **Lack of Strategy :** Most common MIS issues can be traced back to a lack of a solid strategy. Information systems leaders are well aware of the many tools available to gather data on their network. But putting that information to use is often a challenge.

   At one time, technology departments served as a separate operation, providing tech support and keeping an organization's server equipment running. Today, MIS leadership often sits alongside other business leaders, working together to ensure that the technology being used supports the overall mission of the company moving forward.

2. **Meeting Organizational Needs :** MIS plays an ever–increasing role in organizations, with professionals relying on technology for every aspect of operations. Sales and marketing rely heavily on customer relationship software to track client interactions, for instance, while accounting needs its own software for billing, invoicing and financial tracking.

   With more than half of all companies now relying on big data analytics, MIS is playing an even more important role. Before making a decision, today's management teams are likely to pull reports on existing activity to ensure they use facts rather than make educated guesses.

3. **Attracting and Retaining Top Talent :** For at least the past couple decades, the growth in technology has outpaced the number of people entering the field. Over the past seven out of 10 years, IT positions have been in the top 10 of jobs with the most hiring challenges. The professionals most in demand include developers and programmers, database administrators and IT leaders and managers.

   Even as an increasing number of businesses shift to cloud software, the IT shortage continues to affect businesses. If cloud technology providers have difficulty finding professionals to support the applications their clients use, the businesses will see issues. Even with cloud technology, though, many organizations find they still need to have an MIS specialist on staff to ensure the business meets its goals.

4. **Keeping Up with Change :** If one thing is for certain in information technology, it's that nothing will remain the same for long. From one year to the next, innovations mean that software needs to be upgraded and even replaced. In order to remain competitive, businesses have to keep up with this, investing in software that will give them an edge.

   As businesses respond to those changes, though, they face a challenge in getting employees on board with adjusting what they do. At one time this was simply training employees to go from old paper–based processes to using computers in the first place. Today, managers have to onboard new systems while ensuring they provide employees what they need to be productive.

5. **Integrating New Technologies :** Although there are plenty of comprehensive solutions, businesses will inevitably find that they have multiple types of software operating at once. This includes general administrative tools like Microsoft Office, as well as specialized tools for accounting, customer relationship management and project–management tools, among many others. Ensuring all these tools work together is essential since otherwise, employees will find they have to duplicate processes.

Complicating matters is the fact that employees no longer work using just one dedicated computer on a desk in an office space. Many employees work in the field, using laptops and tablets. You'll also have numerous cell phones in addition to the laptop and desktop computers your employees use, bringing challenges to providing support without risking security.

3.6 MARKET SEGMENTATION AND INFORMATION MANAGEMENT :

Data Segmentation is the process of taking the data you hold and dividing it up and grouping similar data together based on the chosen parameters so that you can use it more efficiently within marketing and operations. Examples of Data Segmentation could be **:**

- Gender
- Customers vs. Prospects
- Industry

The key benefits of Data Segmentation are **:**

- You will be able create messaging that is tailored and sophisticated to suit your target market – appealing to their needs better.
- It allows you to easier conduct an analysis of your data stored in your database, helping to identify potential opportunities and challenges based within it.
- Enables you to mass–personalise your marketing communications, reducing costs.

To implement the right kind of data segmentation and to communicate more effectively with your target group requires a blend between having the right processes and technology in place (such as data quality tools and customer data validation). This allows you to analyse and profile your current database, whilst ensuring any incoming data is also segmented accordingly. A key requirement of Data Segmentation is high–quality data, in terms of it being both accurate and does not lack basic information such as "name" or "address".

3.6.1 Management Information System (MIS) :

It is an information system used for decision–making, and for the coordination, control, analysis, and visualization of information in an organization. The study of the management information systems involves people, processes and technology in an organizational context.

Evolution of MIS can be contested that the history of management information systems dates as far back as companies using ledgers to keep track of accounting. The modern history of MIS can be divided into five eras originally identified by Kenneth C. Laudon and Jane Laudon in their seminal textbook Management Information Systems.

1. First Era – Mainframe and minicomputer computing
2. Second Era – Personal computers
3. Third Era – Client/server networks
4. Fourth Era – Enterprise computing
5. Fifth Era – Cloud computing

The terms management information systems (MIS), information management systems (IMS), information system (IS), enterprise resource planning (ERP), computer science, electrical computer engineering, and information technology management (IT) are often confused. MIS is a hierarchical subset of information systems. MIS are more organization–focused narrowing in on leveraging information technology to increase business value. Computer science is more software–focused dealing with the applications that may be used in MIS. Electrical computer engineering is product–focused mainly dealing with the architecture behind computer systems ERP software is a subset of MIS and IT management refers to the technical management of an IT department which may include MIS. Principles of Management Information Systems

While management information systems can be used by any and every level of management, the decision of which systems to implement generally falls upon the chief information officers (CIO) and chief technology officers (CTO). These officers are generally responsible for the overall technology strategy of an organization including evaluating how new technology can help their organization. They act as decision makers in the implementation process of new MIS.

3.6.2 Advantages and Disadvantages of MIS :

MIS can help a company gain a competitive advantage and they can be as follows.

- MIS reports can help with decision–making as well as reduce downtime for actionable items.
- Improve an organization's operational efficiency, add value to existing products, engender innovation and new product development, and help managers make better decisions.
- Companies are able to identify their strengths and weaknesses due to the presence of revenue reports, employee performance records etc. Identifying these aspects can help a company improve its business processes and operations.
- Giving an overall picture of the company.
- Acting as a communication and planning tool.
- The availability of customer data and feedback can help the company to align its business processes according to the needs of its customers. The effective management of customer data can help the company to perform direct marketing and promotion activities.

❖ **Disadvantages of MIS systems :**

- Retrieval and dissemination are dependent on technology hardware and software.
- Potential for inaccurate information.

❑ **Check Your Progress :**

1. Information Integration (II) is merging of information from _____ source.

   (a) Homogenous (b) Heterogeneous

   (c) Mixed (d) None of the above examples

2. The fully integrated information system is used to :

   (a) Reduce Risk (b) Improve Productivity

   (c) Better Communication (d) All of the above options

3. Real time data means :

   (a) Full updated data (b) Data which is real and not fake

   (c) Data use to process (d) None of the above options

4. There are two types of information system controls General Control & _____.

   (a) Specific Control (b) Application Control

   (c) Normal Control (d) All of the above options

5. _____ control prevent unauthorised access to your computer

   (a) Hardware (b) Software

   (c) Both options (a) and (b) (d) None of the above options

6. Ensures critical business data on disk and tapes are not subject to unauthorized access, change or destruction while they are in use or in storage.

   (a) Hardware (b) Software

   (c) Data Security Controls (d) Administrative Controls

7. Application controls can be classified _____, processing and output controls.

   (a) Input (b) Administrative Controls

   (c) Socio–cultural Controls (d) Software Controls

8. Which is not the benefit of computerised scheduling ?

   (a) Build Team (b) Allows prioritising of task

   (c) Enhance Efficiency (c) Time consuming

3.7 LET US SUM UP :

An integrated information system is a combination of software that combines different databases from various sources with data integration tools, visualization and models. For a complex area such as aquaculture, single software becomes insufficient, or very complex and therefore very uncertain. The integrated information system, by assembling them together, allows constructing and exploring complex solutions.

Protection of information resources requires a well–designed set of controls. Computer systems are controlled by a combination of general controls and application controls. General controls govern the design, security, and use of computer programs and the security of data files in general throughout the organization's information technology infrastructure. On the whole, general controls apply to all computerized applications and consist of a combination of hardware, software, and manual procedures that create an overall control environment. Application controls are specific controls unique to each computerized application, such as payroll or order processing. They consist of controls applied from the business functional area of a particular system and from programmed procedures.

The first step of computerizing a schedule is to enter it into a hosted calendar system. Most shared calendars allow users to designate parts of their schedules as public, and parts as private, so for example a user can publish her work schedule and available work time for meetings, but hide the personal areas of her calendar. In this model, most calendaring systems allow users to request meeting times, which then need to be confirmed by the invited participants before it shows up as an appointment.

In a corporate setting, the ultimate goal of the use of a management information system is to increase the value and profits of the business. This is done by providing managers with timely and appropriate information allowing them to make effective decisions within a shorter period of time.

3.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. (a), 2. (b), 3. (a), 4. (c)

5. (b), 6. (c), 7. (a), 8. (d)

3.9 GLOSSARY :

Team Building : It is a collective term for various types of activities used to enhance social relations and define roles within teams, often involving collaborative tasks.

Software : It is the programs and other operating information used by a computer.

Hardware : Computer hardware refers to the physical parts of a computer and related devices.

A management information system (MIS) : It is a computer system consisting of hardware and software that serves as the backbone of an organization's operations.

3.10 ASSIGNMENT :

1. What is general controls, explain its each type ?
2. What are the uses of Integrated Information System ?
3. How scheduling system benefits for businesses ?
4. What are the issues related to information system ?
5. What are the advantages and disadvantages of MIS ?

3.11 ACTIVITIES :

1. Make your daily schedule in your mobile phone and try to complete the task by putting reminders in it. After 5 days of observation analyse your productivity.

3.12 CASE STUDY :

❖ **Information System In Restaurant :**

A waiter takes an order at a table, and then enters it online via one of the six terminals located in the restaurant dining room. The order is routed to a printer in the appropriate preparation area : the cold item printer if it is a salad, the hot–item printer if it is a hot sandwich or the bar printer if it is a drink. A customer's meal check–listing (bill) the items ordered and the respective prices are automatically generated. This ordering system eliminates the old three–carbon–copy guest check system as well as any problems caused by a waiter's handwriting. When the kitchen runs out of a food item, the cooks send out an 'out of stock' message, which will be displayed on the dining room terminals when waiters try to order that item. This gives the waiters faster feedback, enabling them to give better service to the customers. Other system features aid management in the planning and control of their restaurant business. The system provides up–to–the–minute information on the food items ordered and breaks out percentages showing sales of each item versus total sales. This helps management plan menus according to customers' tastes. The system also compares the weekly sales totals versus food costs, allowing planning for tighter cost controls. In addition, whenever an order is voided, the reasons for the void are keyed in. This may help later in management decisions, especially if the voids consistently related to food or service. Acceptance of the system by the users is exceptionally high since the waiters and waitresses were involved in the selection and design process. All

potential users were asked to give their impressions and ideas about the various systems available before one was chosen.

3.13 FURTHER READING :

1. Foundations of Information Technology by D.S.Yadav, New Age International (P) Ltd., Publishers
2. Management Information System, Dr. P. Usha Madhuri, Charulatha Publication

BLOCK SUMMARY :

An Information System is a collection of components that work together to provide information to help in the operations and management of an organization.

Information Technology is the integration of computers, communications equipment, and other technology used in information systems. Information Systems Functions are Input Function, Storage Function, Processing Function and Output Function. Information Systems have many benefits like, Better information, improved service, increased productivity and competitive advantage.

Before starting of this century data and information were handled manually. It is with the time and technology we have shifted our work on hardware and software. Surprisingly things have become so smooth and effective that we could save lot of resources which we can divert to earn more profits.

Requirement is nothing but inputs to the software system, its behaviour, and outputs. In software engineering and systems engineering, a functional requirement can range from the high–level abstract statement of the sender's necessity to detailed mathematical functional requirement specifications. Functional software requirements help you to capture the intended behaviour of the system.

To know about customer experiences you have to get customer feedback. There are plenty of ways you can pull customer feedback and get benefitted from this. Customer feedback is information provided by clients about whether they are satisfied or dissatisfied with a product or service and about general experience they had with a company. Their opinion is a resource for improving customer experience and adjusting your actions to their needs.

Information Systems controls are a set of procedures and technological measures to ensure secure and efficient operation of information within an organization. Both general and application controls are used for safeguarding information systems. Controls are the methods, policies, and organizational procedures that ensure safety of organization's assets; accuracy and reliability of its accounting records; and operational adherence to management standards.

BLOCK ASSIGNMENT :

1. Elaborate the concept of customer feedback and expatiation with examples.
2. What is functional requirement of information system and its benefits ?
3. What information flow operation and challenges of flow in offices ?
4. Explain the information flow 4 direction with example.
5. How barriers of flow are be eliminated in an organisation ?
6. Explain the term Management Information System with example.
7. "The fully integrated information system is use to reduce risk, improve productivity, better communication". Discuss this statement.
8. How general control is different from application control, explain ?
9. Schedules are important aspects of operation and digitisation has made it much advanced. How ?