

COMPUTER RESERVATION SYSTEM



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ISBN 978-81-949223-5-3

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!

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BLOCK 1 : FUNDAMENTALS OF COMPUTER

UNIT 1 DIGITAL ANATOMY OF COMPUTER

UNIT 2 WORD PROCESSOR

UNIT 3 SPREADSHEETS

UNIT 4 PRESENTATION PROGRAM

FUNDAMENTALS OF COMPUTER

Block Introduction :

In the modern age, the computer with internet is one of the basics elements after food, clothes and accommodation. You have been surrounded by technology in your day to day work. Learning computer and its utilisation is required to communicate with anyone in the world like learning the language is necessary to communicate with others. In Covid-19 pandemic 2020, knowledge of computer and internet is one of the major aspect, which serves or facilitate to everyone by providing medical facilities, food, grocery, medicine etc at your doorstep. In the central reservation system (CRS), we use software to connect with the service provider and client with the help of internet. I don't think without the knowledge of basics of computer like hardware's, selection of software and its features, you can work effectively.

In this Block, the student will get some ideas about system configuration, latest hardware, function, selection of hardware and software as for the need, features of the software, how to utilise the function or tool available in software, which gives the platform to the user for corresponding with the client in a better way.

Block Objectives :

After learning this block, you will be able to understand :

- About the Operating System.
- Types of Operating System.
- Features of Operating System.
- To know about the Hardware.
- To know about the CPU.
- Various aspects of CPU.
- To know about the RAM.
- To know about the ROM.
- To know about the Graphics card.
- To know about the USB.
- To know about the Mouse.
- To know about the keyboard.
- To know about the hard drive and SSD.

- To know about the word processor.
- Types of the word processor.
- Features of the word processor.
- Learn to use a few tools in Microsoft Word.
- To know about the spreadsheet.
- Various spreadsheets programme available in the market.
- Features of spreadsheets programme.
- Learn to use a few tools or functions in Microsoft excel.
- What is a presentation programme or software ?
- Various presentation programme available in the market.
- Features of presentation software.
- To know about Preventive maintenance.
- To know about the Hardware preventive maintenance.
- To know about Software preventive maintenance.

Block Structure :

Unit 1 : Digital Anatomy of Computer

Unit 2 : Word Processor

Unit 3 : Spreadsheets

Unit 4 : Presentation Program

UNIT STRUCTURE

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1.0 LEARNING OBJECTIVES :

From this chapter, you can identify the importance of computers, what is OS, its type, Hardwar, and its role in computers. So that you have an idea of how a computer functions along with help you to select the best computer according to your needs.

1.1 INTRODUCTION :

The boom of computation is continuously increasing after a drastic change in technology and the availability of the internet in each corner of the world. The computer is boosting our performance by giving a lot of updated information. If you look around yourself, you cannot escape from using the computer in day to day life, whether it starts right from the grocery or to the sanitary product followed by the Central Reservation System (CRS) in Airline. Everywhere the

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use of computers or technology around you. Even you surprised to know the TV you are watching right now required a laptop. If you think how ? Let me explain with this example– What about the channel you are watching ? You subscribed to it, right. The channel you subscribed to and paid for that all the things are maintaining in computers only. Even if you go for Pollution under Control (PUC) of your vehicle you must have seen, the moment the persons scanned the number plate of your car automatically the computer they are using connected to the server of Region Transport Office (RTO) is giving the pieces of information about the vehicles you are using. At the same time, it produces a database that is linked to your car.

All the things are only possible in computers if you have a better architect of computers. The architecture of machines consists of hardware, software, and the communication channel. The excellent combination of hardware and software able to provide higher speed so that you can analyse the data and come to any conclusion, which helps you to decide about business, education, and related to money and so on. You must have seen the people; wherever they go, they have the mobile along with them that mobile is also not less than any laptop or desktop because it has got a combination of software and hardware which produce the data or information for the user. The device in your hand or on the table which you are using cannot be useful without a detailed understanding of hardware and software. If you want to be professional in most of the jobs, you need to know how a computer works.

All the organizations and people depend on the database which has produced by computers. To create the database properly for the utilization some elements are essential; they are as follows–

The data element – The data is a combination of fact and figures which help us to make a decision. Information is collected through computers from different sources to understand anything which is happening around the globe. Data may be in a different form for a different purpose. The future forecast also is done on the base of data collected globally or individually.

The hardware element – If you have the latest hardware, it works faster. It does the data capturing at a higher speed; also, it saves that information at a faster pace because of specific advanced hardware. It communicates with other devices in a better way with safety and securities. The hardware is also considered a one–time investment for a better configuration of the computer.

The software element– If you have the latest software, it gives you a lot of facilities along with it does the process at the highest speed to produce maximum results. The software also improves the effectiveness of the user. To get the update or latest being the user, you continue paying for a subscription for a particular timeframe.

The communication element– In modern computers, you can share the processing and data with a different user in both local area network (LAN) or wide area network (WAN).

So, let's start learning about the hardware and software along with the operating systems to have a better understanding of using the technology effectively.

1.2 OPERATING SYSTEM (OS) :

It's a layer with multiple software between the user and hardware's so that by using the software, the user can use the hardware to produce the desired result. The Power of Operating System can also handle multi-tasking, distributing hardware resources among multiple running programs based on the requirement. The operating system is too smart enough to allocate CPUs or cores, Random Access Memory (RAM), and graphics card to run the programmed smooth. It also manages the system's primary memory, allocating memory between running applications.

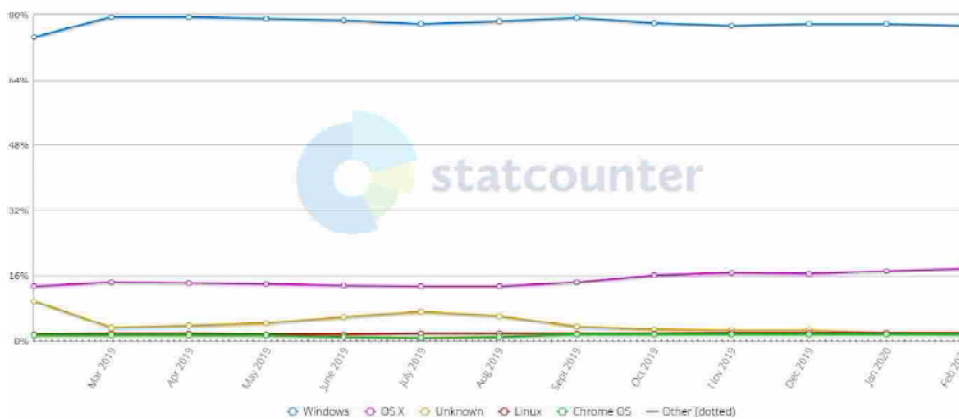
The comfortable and clean interface of an operating system is suitable for most users for using the system. These are the few lists of OS available worldwide – Microsoft – Windows, Ubuntu, Mac OS, Fedora, Solaris, Free BSD, Chrome OS, CentOS, Debian, and Deepin.

❖ **Comparison of few Operating Systems as on Today :**

OS	Support Architecture	Used in System	Security Risk	Good for	Cost	Official Website
Windows	X86, x86-64,	Workstation, Personal Computer	Huge	Apps, Gaming, Browsing	₹ 7,000.00	Windows
Mac OS	68k, Power PC	Workstation, Personal Computer	Negligible	Apple Exclusive Apps	Free	Mac OS
Ubuntu	X86, X86-64, Power PC, SPARC, Alpha.	Desktop/server	Negligible	Open Source Downloading, APPS	Free	Ubuntu
Fedora	X86, X86-64, Power PC, SPARC, Alpha.	Desktop/server	Negligible	Coding, Corporate Use	Free	Fedora

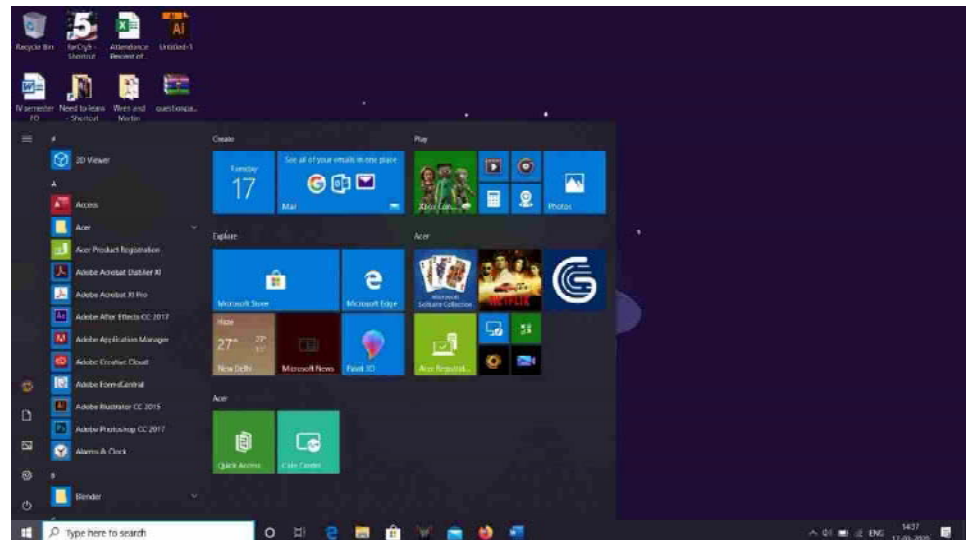
Desktop Operating System Market Share Worldwide

Feb 2019 - Feb 2020



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1.2.1 No-1. Microsoft-Windows :



Windows is the most used and well-known operating system in the world. From the beginning till date, it has been customized a lot in operating software to convenient most of the user. Also loaded with the software which is required in day to day life.

It is user-friendly and starts up are organized in such an excellent way that users get things quickly. To make it fast, you should not install lots of heavy software like Adobe Photoshop, Maya, and Adobe After Effect, etc. The latest versions have more updated graphics and built-in security to keep you and your computer safe.

❖ **Benefits :**

- A friendly User Interface which helps the user to navigate quickly, with a start menu on the left side by listing out installed applications in Alphabetical way.
- The Task View, which is in the bottom near the talk to Cortana having facilitated the users switch between multiple workspaces and also shows the open Windows.
- Tablet Mode is designed for touchscreens, which are available in the righthand bottom corner.
- Multiway login authentication technology is for higher security like PIN, Fingerprint recognition, Image, etc.
- Automatically compress the system files to reduce the storage in Hard disk so that the user can use more space.

Result : The Windows software is simple and best because of customized as for the requirement of the user. Its easy interface allows the user to do maximum work within less time. The only hitch is you need to pay for it.

1.2.2 No-2. Mac OS :



The Mac OS is a default operating system found in all Apple devices nowadays. The technology has evolved with time to provide the features and securities.

In today scenario, the MAC operating systems is free with all Apple system along with the free upgrade by its developers. For Apple users, the hardware is design in such a way it only supports MAC OS.

❖ **Benefits :**

- Has introduced the new dark mode gives interface a new look, which is easier on the eyes.
- A dynamic desktop used for organizes your desktop files on the base of kind, date, or tag.
- Just because you signed in to iCloud with the same Apple ID, Continuity camera that scans or photographs automatically appears on your mac.
- In the MAC app store, you can get new or updated apps.
- The new interface of iTunes allows the users to search for songs with few lyrics and purchase it.
- Websites are tracking Prevented by Mac by making your profile more anonymous online.

Result : The Mac's is the biggest success for its slim design, which is easy to carry along with its unique interface. Generally, it's a neat looking OS today. Now, Apple is pushing the upgrade free for its users to get the latest experience as a loyal user. Generally, all the devices are more expensive in comparison to other devices.

1.2.3 No-3. Linux-kernel based, and UNIX based operating system :

Lots of Operating System (OS) available in the market free of cost. All these (OS) are Linux-kernel based or UNIX based operating systems only. It comes with a bundle of free apps with pre-compiled software. To make the user easy to install with a friendly interface. Few examples are Debian, Chrome OS, Solaris, FreeBSD, etc.

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❑ Check Your Progress – 1 :

- OS stands for
 - Operating Support
 - Operating Software
 - Output Standard
 - Operation Standard
- CRS stands for
 - Central Reservation Software
 - Central Retail System
 - Control Retail Software
 - Central Reservation System
- Which Operating System is suitable for Apps, Gaming, Browsing ?
 - Windows
 - Mac OS
 - Ubuntu
 - Fedora

1.3 HARDWARE :

Hardware is a term that refers to the physical part of any computer or electronic device. Which we can touch and feel it. The combination of lots of hardware makes the machine work. Few examples of hardware are CPU, mouse, keyboard, USB, RAM, ROM and video card, etc.

1.3.1 CPU :

The central processing unit (CPU) is a significant feature of any computer. The CPU is also called the Brain of the computer. The evolution in architect is surprisingly increasing the performance. Some architecture may or may not have a particular instruction, the amount of addressable memory, or the data that are periodically processed by CPU. Some architectures are entirely different from each other.

Intel and AMD are the two most prominent manufacturers of CPU. At this moment, i9 (10th generation) by intel and Ryzen threadripper by AMD is the latest CPU in the market. The full form of AMD is Advanced Micro Devices is an American company.

The greater number of cores enhance the performance. If you see the market, most of the computers are having an intel processor because of the trust. However, Intel is more expensive than the AMD, but most of the bigger companies are now switching from Intel to AMD to save a huge amount of money. 32-bit and 64-bit are two types of processor architecture or design. A 32-bit processor has a 32-bit register, and A 64-bit processor has a 64-bit register. 32-bit can store 232 or 4,294,967,296 values and 64-bit can store 264 or 18, 446, 744, 073, 709, 551, 616 values. Thatswhy, a 64-bit register, is not double as a 32-bit register but is 4, 294, 967, 296 times larger. That's a major difference, which improves computing performance.

The CPU register stores memory addresses, which help the processor accesses data from RAM. One bit in the register can reference an individual byte in memory, for that, a 32-bit system can handle a maximum of 4 Gb (4, 294, 967, 296 bytes) of RAM. In most of the cases, the actual limit is less – approximately 3.5 gigabytes – since part of the registry is used to store other temporary values besides memory addresses.

A 64-bit register machine can be calculated as 18, 446, 744, 073, 709, 551, 616 bytes, or 17, 179, 869, 184 gigabytes (16 exabytes) of memory. Which is much more times more than an average workstation would need to access. The important thing is that a 64-bit computer can handle more than 4 GB of RAM

easily. If a computer has more than 4 GB RAM, it is always better you should have a 64-bit processor, which utilizes the whole RAM to increase the performance.



1.3.2 RAM :

Random-access memory (RAM) is a temporary storage device, which holds running program instruction. It means the moment you switch on your computer, mobile, or PlayStation automatically RAM allocation has been done for OS and whatever application run by you as a user uses the ram to keep the file, which is required to run that application smoothly. If you have more RAM, it can handle two or three application instructions to help the system to start that application faster. The double data rate fourth (DDR4) is the newest generation in RAM till July 2020. It is also called volatile memory means the data or information available until the device is powered on. Nowadays, most systems have 4 Gb ram.



1.3.3 Optane Memory :

It's a new technology introduced by Intel to improve boot times and accelerate system performance in desktop PCs and laptops. It's an additional data cache between its CPUs and storage devices like HDD. This Optane memory is not faster than RAM, but it may be faster than some SSD.

1.3.4 Rom :

ROM stands for read-only memory. It is non-volatile memory means after you switch off the system, also the data will remain in ROM. Almost all the computers come with a small amount of ROM, which tells the system what to do when it start-up, for example : loading OS and install hardware diagnostic into RAM.

1.3.5 Graphics Card :

The hardware, which is responsible for producing the quality image on a screen. It converts the data into a signal your monitor can understand. The latest graphics available on your computer is perfect for rendering. The graphics card is highly recommended for games and video editor. Most of the laptop comes with integrated graphics. These types of laptop models cannot be upgraded easily. The professional gamer and video editor installed the graphics card as an extra component in the motherboard. So that it can be upgraded in the future easily. However, upgrading the graphics card is an expensive affair. Two major players in the graphics industry are Nvidia and AMD so far. To complete, both push for maximum frames at 4k resolution. Rx series launched by AMD and RTX series launched by Nvidia. The rapid change in graphics technology produces a more

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realistic and eye–appealing image, game and animation, etc. DDR5X is the latest technology in Graphics card. GDDR5 is an abbreviation for graphics double data rate type five.



1.3.6 USB :

It stands for universal serial bus. It is a connector, cables, and communication protocol. It is connecting two devices and provide power supply. USB 3.0 is the latest technology in USB, which is ten times faster than USB 2.0. It supports transfer rates of 4.8 Gbps. Generally, USB 2.0 is black inside, while USB 3.0 is blue inside. USB 3.1 is having a reversible type C connector.



1.3.7 Mouse :

The mouse is well known as a point and draw device. It is handheld hardware, which is used as an input device. The moment of the mouse cursor allows the user to select text from icons, files, and folders on your computer graphical user interface (GUI). Wireless and gaming mouse are new varieties in the market. However, a gaming mouse is more expensive in comparison to other types of mouse.



1.3.8 Keyboard :

The keyboard is the most used input device among most users. The professionals are using the keyboard rather than a mouse. The QWERTY keyboard is the most common keyboard used in worldwide. It is named after the first five keys under the row of number keys on the keyboard. The multimedia keyboard used by most users for accessing programs by pressing buttons. Such as internet browser, power button, play and pause button, etc.



1.3.9 Hard drive and SSD :

Hard disk drives (HDD) the old technology to store and retrieve data, whereas solid–state drive (SSD) is the new technology in the secondary storage device. SSD is faster and expensive than the hard drive. The hard drive is called

a mechanical drive because most of the HDD is 5400 RPM (Revolution per minute), and SSD is called flash technology. Operating system boot faster if it installed in SSD rather than HDD.



❑ **Check Your Progress – 2 :**

- Which secondary storage device is faster in operation ?
(a) SSD (b) HDD
(c) BLUERAY DISC (d) PENDRIVE
- Among these, which is the best USB ?
(a) USB 1.0 (b) USB 2.0 (c) USB 3.0 (d) USB 4.0
- Among these, which one is the example of two leading graphics card manufacturers company ?
(a) Microsoft & Mac (b) Intel & Nvidia
(c) Nvidia and AMD (d) Intel & AMD
- Among these, which are the example of two processor manufacturers company ?
(a) Microsoft & Mac (b) Intel & Nvidia
(c) Nvidia and AMD (d) Intel & AMD
- Which is the latest technology in Graphic cards till July 2020 ?
(a) DDR3 (b) DDR4 (c) GDDR5 (d) GDDR5X
- Which is the latest technology in RAM till July 2020 ?
(a) DDR3 (b) DDR4 (c) DDR5 (d) DDR6
- Which is the latest CPU from Intel till July 2020 ?
(a) i3 10th gen (b) i5 10th gen (c) i7 10th gen (d) i9 10th gen

1.4 LET US SUM UP :

An operating system is a necessity that is required to run your computer at your pace. There are many OS available to make it possible. Choose the best operating system, hardware and software's that satisfies your needs.

From the above illustration or explanation, we conclude that for personal use like gaming and browsing, then Windows is best for you. If you have an Apple device, then you have the only option of using the MAC OS.

For corporates or businesses, there is the option of Linux and UNIX based OS. However, the employees should know the utilization to maximize the output.

Note that All the updates mentioned in this chapter are up to date till 1st July 2020.

1.5 ANSWERS FOR CHECK YOUR PROGRESS :

- ❑ **Check Your Progress 1 :**
 - (1) Operating Software
 - (2) Central Reservation System
 - (3) Windows

- ❑ **Check Your Progress 2 :**
 - (1) SSD
 - (2) USB 3.0
 - (3) Nvidia and AMD
 - (4) Intel & AMD
 - (5) GDDR5X
 - (6) DDR4
 - (7) i9 10th gen

1.6 GLOSSARY :

CRS – Central Reservation System

PUC – Pollution under Control

LAN – Local area network

WAN – Wide area network

OS – Operating System

RAM – Random Access Memory

Hardware – Hardware is a term that refers to the physical part of any computer or electronic device.

CPU – Central processing unit

AMD – Advanced Micro Devices

RAM – Random-access memory

DDR4 – Double data rate fourth

ROM – Read-only memory

GDDR5 – Graphics double data rate type five

USB – Universal serial bus

GUI – Graphical user interface

QWERTY keyboard – It is named after the first five keys under the row of number keys on the keyboard.

HDD – Hard disk drive

SSD – Solid-state drive

1.7 ASSIGNMENT :

- How to Maintain your Computer System (Hardware and Software).
- How to Upgrade the software's and the hardware's.

1.8 ACTIVITIES :

As a user, check the configuration of your computer and make a list of it.

Survey 20 computers nearby you to find out which Operating System is used most along with hardware specification followed by the pricing.

1.9 CASE STUDY :

❖ Case Study – 1 :

Mr. Dinesh is the Managing Director of a well-established Graphics Company named Miracle situated in the heart of the city. The company has spread the wings across the globe for graphic work with 1200 staff. Mr. Dinesh is in a situation where he must decide to purchase 1150 new computers because all the machines are outdated now. Being the MD of a company, what are the factors he needs to consider buying the new device to fulfil the requirement of the company.

❖ Case Study – 2 :

Mr. Anil is an accountant of an institute as a full-time. At the same time, he does the accounting for two to three small organizations as part-time from home in the evening. Just because he is maintaining accounts for lots of organization's wants to buy a Personal computer. What are the hardware and software he needs to check before buying the PC ?

1.10 FURTHER READING :

<https://www.microsoft.com/en-us/windows>

<https://www.apple.com/macOS/catalina/>

<https://www.intel.in>

<https://www.amd.com>

<https://statcounter.com/>

The architecture of computer hardware, systems software & networking, fourth edition by Irv Englander

Operating System Concepts by Abraham Silberschatz, Peter B. Galvin, Greg Gagne



UNIT STRUCTURE

- 2.0 Learning objectives
- 2.1 Introduction
- 2.2 Let's have a look of few free and paid word processor
 - 2.2.1 Wps office-writer
 - 2.2.2 Libre Office Writer
 - 2.2.3 Focus Writer
 - 2.2.4 InCopy
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 - 2.2.6 Microsoft Word
- 2.3 Let Us Sum Up
- 2.4 Answers for Check Your Progress
- 2.5 Glossary
- 2.6 Assignment
- 2.7 Activity
- 2.8 Case Study
- 2.9 Further Reading

2.0 LEARNING OBJECTIVES :

From this chapter, you understand the word processor, free and paid word processor software available in the market, standard tools provided by the word processor so that you can easily select the word processor, which is best suitable for your needs.

2.1 INTRODUCTION :

In the age of automation, we are using a particular application in our computer to create, edit, and print documents rather than pen and paper. Whatever the material produced by us can preserve for a longer duration, and we can edit it several times. In the market, a lot of applications are available among these few are free, and few are chargeable. Few examples of Free and open-source software are WPS Office Free Writer, LibreOffice Writer, FocusWriter, SoftMaker FreeOffice TextMaker, WriteMonkey, and Proprietary software's are Microsoft Word, Apple Pages, InCopy, Polaris Office, WordPerfect, etc. From all word processors, Microsoft word processor is the most common. To use this piece of software, you need a computer with a hardware and software specification. For example, you cannot install the 2013 onwards Microsoft word in Vista (OS) because the minimum requirement is Windows 7. A word processor allows the user to create a document, store it electronically on a disk or cloud storage, display it on a screen, modify it by entering the text, image, and special characters from the keyboard, whenever you required can go for hardcopy.

The best advantage of any word processor is you can edit it without retyping the entire document. If you make a spelling mistake or sentence formation mistake, you simply take the cursor to the desired location and correct your error. If you want to delete a particular paragraph, you simply select the whole section and delete it, without leaving a trace. It is also easy to insert a new word, sentence, or paragraph in the middle of a document. Most of the Word processors have got the facility to move sections within a document or between documents.

Though all the Word processors are different from each other all the word processors support the following basic features :

Insert text : Allows the user to insert text anywhere in the document that may be online or offline.

Delete text : Allows you to erase alphabet, words, lines, or pages as quickly as you can clean from the blackboard.

Cut and paste : Allows you to remove (cut) a particular selection of text from one place in a document and insert (paste) it somewhere else like cutting an image or piece of relevant text from newspaper and paste it in the chart paper to make a collage.

Copy : Allows you to duplicate the same text or image and past in the same or another document. In the same manner, we copy from a textbook to our notebook.

Page size and margins : Organise the text or image in a word processor in a way that supports various page sizes and margins to produce a print out of any document.

Search and replace : It allows the user to find out a particular word or phrase quickly. You can also instruct the word processor to replace one word with another new word all together instead of going the same word again and again to change it. For example, it is like changing a name that has been using several times in a document by using this tool.

Word wrap : As for your paper size selection, the word processor automatically starts a new line when you have finished one line with text, and it will readjust text if you change the margins.

Print : Allows you to send a document to a preferred printer to get a hardcopy. The newly updated word processors have got extra features that allow you to manipulate and format documents in more sophisticated ways. Generally, more advanced word processors are sometimes called full-featured word processors. Full-featured word processors usually support the following features :

File management : Most word processors provide the facility of file management capabilities that allow you to create and save in a particular folder, cloud storage or hard disc in a way to access it easily. Whenever you want to delete or move from the storage device, you can do it within a moment, also provide a search feature with a specific name or extension.

Font specifications : Allows you to use multiple fonts or typeface within a document. For example, you can specify fonts for Headings along with bold, italics, and underlining formats. At the time of editing, word processors also let you change the font size and even the typeface.

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Footnotes and cross–references : Used to automates the numbering and placement of footnotes enable you to cross–reference easily or linked other sections of the document.

Graphics : Allows you to embed images and graphs into a document. Some word processors allow you to edit the image within the word processor; others let you insert an edited image produced by a different program.

Headers, footers, and page numbering : Allows you to customized specific headers and footers that the word processor will insert at the top and bottom of every page in your document. If you added the Page number in top or bottom, It automatically updated the page numbers in the whole document.

Layout : Allows you to specify margins for that single file or save as default for other new document and to specify various methods for indenting paragraphs.

Macros : A macro records the series of keystrokes and make a group together as a single command to accomplish a task automatically. The keystrokes may represent text or commands you have been using during your macro recorder is on. The ability of macros allows you to save a lot of time by replacing common combinations of keystrokes.

Merges : it allows the user to extract information from another file into one file. This tool is used for generating many individual reports or records that have the same format but different data. For example, you have created marks sheet in excel, but you want to send single scores of a student to their parents.

Spell checker : An additional tool highlights the wrong word or the words that it does not recognize with a red zigzag underline.

Tables of contents and indexes : Allows you to create a table of contents with page no automatically. Also, it arranges chapter wise followed by heading and subheading.

Thesaurus : A offline thesaurus that allows you to search for synonyms without leaving the word processor.

Windows : Allows you to view or edit on the same document or another at the same time. Each file appears in a separate window. It is useful when working on a large project that consists of several different files.

What you see on your screen, exactly you get in print out.

2.2 LET'S HAVE A LOOK OF FEW FREE AND PAID WORD PROCESSOR :

2.2.1 Wps office–writer :



Operating system : Windows, macOS, Linux, Android, iOS, web

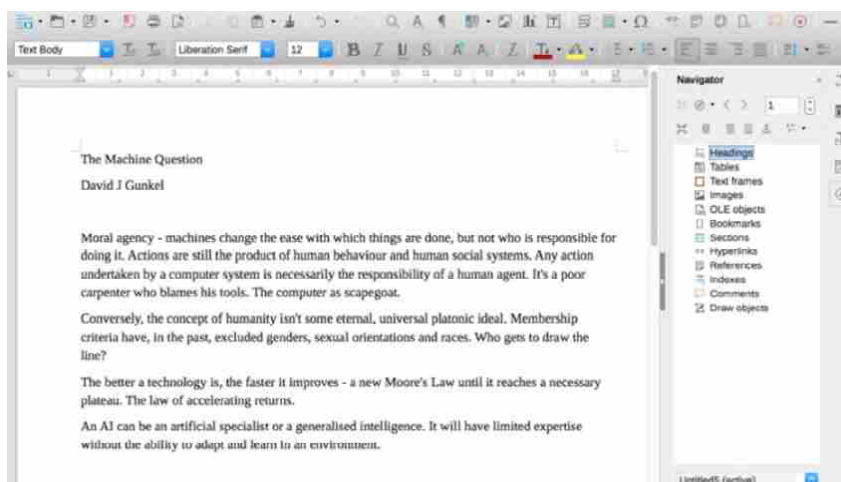
- It's free to use. Only the instable file size is 148MB.
- All in One Mode : Documents, Spreadsheets, Presentation, PDF, all tabs in one window like the browser.
- Excellent file format support with PDF Comment, Convert, Compress, Sign, etc.
- Cloud : One WPS account, work anytime, anywhere with 1 GB Free cloud storage.
- Skin Centre : Multiple skins allow you to set, as for your mood.
- Contains some online ads

If you've ever experienced a new version of Microsoft Word, the interface and the way of interacting is almost the same in WPS Writer. WPS Office Software is a product of Kingsoft Corporation, China's leading Internet services, and software company. It is a free word processor that competes premium featured word processors in the market. Moreover, it has an equivalent of OneDrive, offering 1GB free cloud storage.

Provide more pre-installed templates gives you everything you need for common document types, and you can easily personalize your task. It's compatible with almost every text file format you can imagine, including modern and old versions of Microsoft Word dating back to Office 97.

WPS Office Writer is financially supported by ads, which can be easily removed by upgrading to the premium version by paying a certain amount of money; also, you can get a few additional features with it. Overall, WPS Writer is impressive, and in my opinion, this is one of the best free word processor available to download as of today. It recently launched a free PDF to Word converter as well, which is a great companion to its word processor.

2.2.2 LibreOffice Writer :



Operating system : Windows, macOS, Linux, Android

- Great-looking, well-structured documents
- Use documents of all kinds
- Get more features with extensions
- No ads or Payment for Premium
- Free as in Freedom, now and forever

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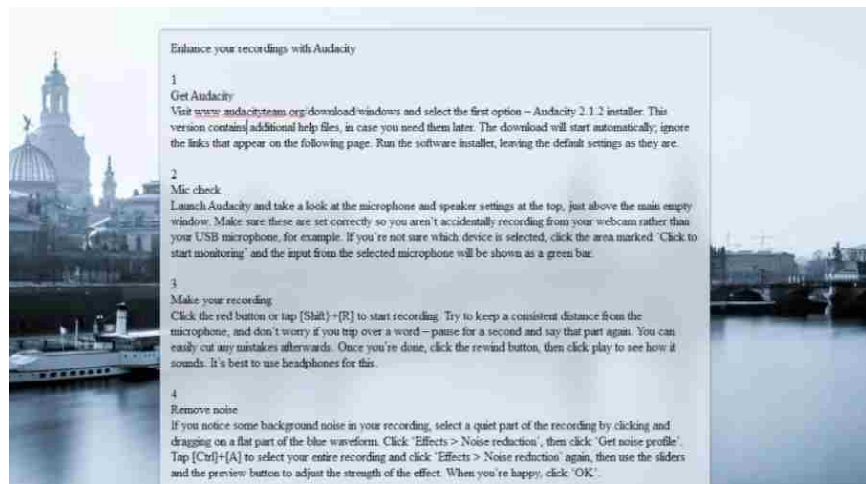
LibreOffice is the most powerful Free and Open Source write in the market. LibreOffice receives more frequent updates from the developer worldwide.

The word processor, Writer, is a feature-packed like Microsoft Word, available with all the tools you need for customized text-based work. An option has been added to prevent shapes from overlapping each other when you are using a shape tool. After commented can be marked as resolved. The new features allow the user to add a comment on images and charts too. The new Paste Special menu option helps the user to have better control over copying, cutting, and pasting of tables.

The wizards and templates are two versions of Writer for common document types, such as invoices and letters, and it's easy to create your templates for future use as well. The word processors can effectively use the other office software in their respective suites – so you can use Base to create a bibliography, for example.

Without the need of any third-party software, you can export as a PDF or other known formats. If you're looking for a word processor free in comparison with Microsoft Word, this can be one of the right options.

2.2.3 FocusWriter :



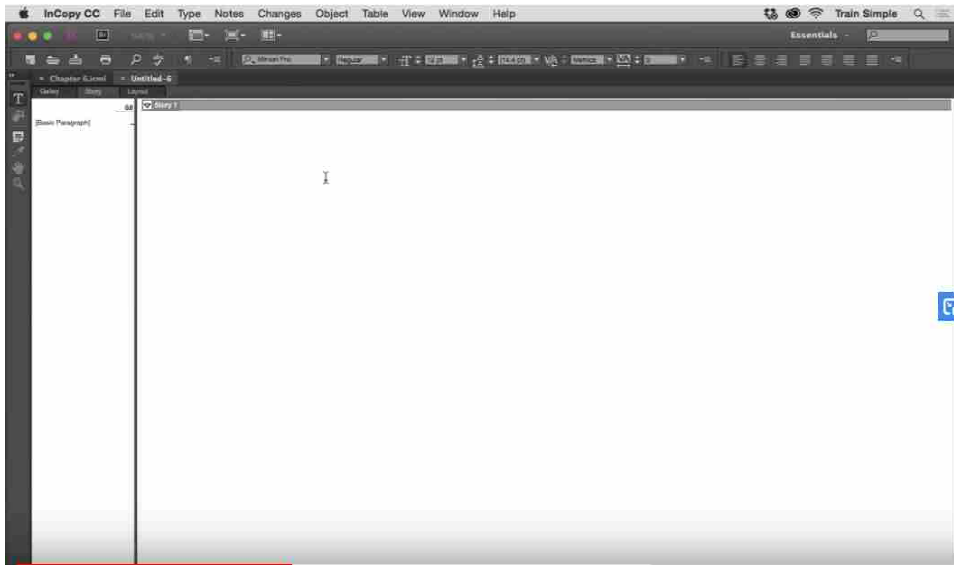
Operating system : Windows, macOS, Linux

- Distraction-free writing environment
- Can set the timers and alarms
- Auto-save function
- Not suitable for editing

As for the name, FocusWriter allows you to write without worrying about any formatting like pen and paper. It is something like a built-in WordPad app in Windows. In regular use, all you see is a blank page – toolbars are hidden only visible if you move your cursor to the edge of the screen. With a little feature called Focused Text, which fades everything into the background except the current paragraph or sentence.

FocusWriter featured with time trigger alarm, or when you've reached a pre-specified word count, so you don't need to worry about watching a counter (as you would in Microsoft Word). It is the right choice for writers who want to involve in writing only by keeping a timeframe. It's not great for editing, but a very productive tool for writing.

2.2.4 InCopy :



Operating system : Windows and Mac OS

- Add paragraph borders
- Modern user interface
- Place images into tables
- Quick font searching, and View recently used fonts
- A simple application of shading to text; includes controls for offsets and more

InCopy is a paid professional word processor from ADOBE. Approximately it charges ₹ 4500 for one year. The software allows the user to write, edit, and design documents. Like other word processing software, it also has features such as spell check, track changes, and word count. The user may have the experience like the designer with several viewing modes.

It has three viewing modes. The story mode is useful for reading and editing text in a screen-wide view without page formatting. The galley mode displays text line numbers and the same line-breaks without page formatting option. In the above two methods, it does not display the actual formatting. The layout mode shows the original page design layout, along with images and overset text.

Yes, it can be used as a word processor (with advanced printing and exporting functions), it is primarily used to communicate with Adobe InDesign. Adobe LiveEdit rights management system provided the facility to the writers, the editors and the designers can work simultaneously on the same page if it integrated correctly. The designer creates the page layout with InDesign, while editors simultaneously edit different content with InCopy.

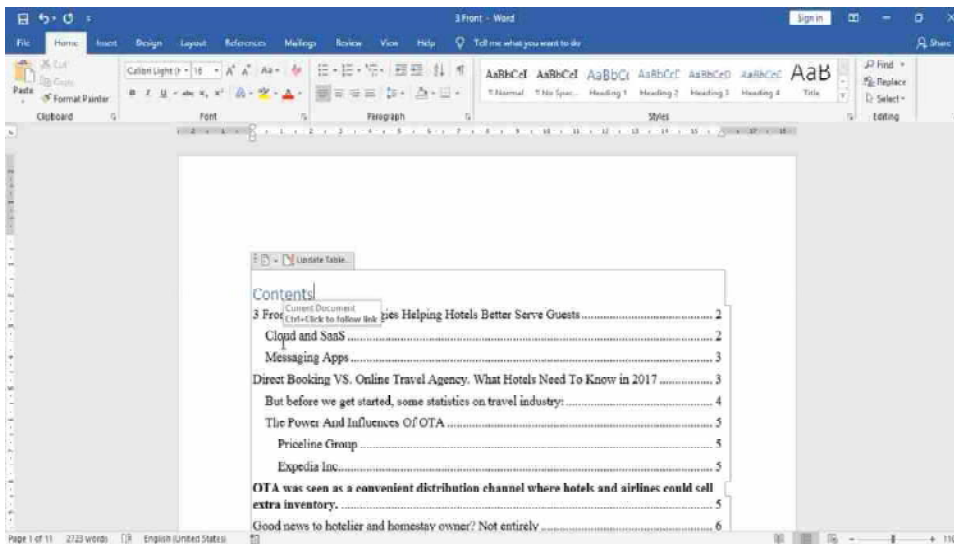
2.2.5 Pages :

Apple Inc also developed a powerful word processor called Pages to create a stunning document. It is running on the macOS, iPad, and iOS 12 or later operating systems. In iPad, you can use Apple Pencil to add comments and illustrations by hand. The multiple device supports like Mac, iPad, iPhone or pc allows the team members to work together. Pages is an easy-to-use application that allows users to create documents on their devices quickly.

Whereas Office 2019 is sold as a one-time purchase, which means you pay once and used for a more extended period for one computer. One-time purchase facilities are available for both PCs and Macs. If you want to upgrade to new release software to get major facilities, you need to pay the full amount, but the same will continue for new release also. The new extension of the new Microsoft word file is .docx.

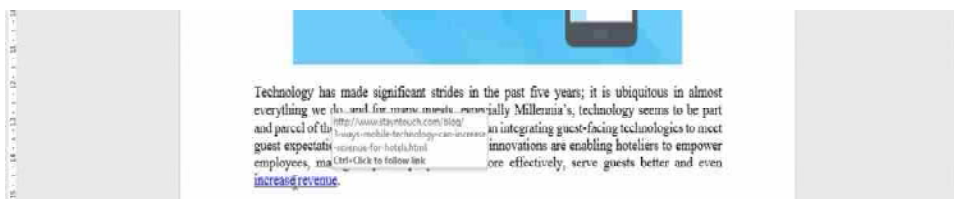
As you know it is so popular among the word processor, let's discuss a few extraordinary features of Microsoft word.

2.2.6.1 Table of contents :



You can create the table of contents in Microsoft Word on the basis of headings in your document like Chapter names, Topics names and Subtopics names, etc. which makes the table automated in terms of updating new pages or new topics in the table of content. By pressing the Ctrl/Command key along with the left mouse button, you can directly go to that page, which has that specific topic. Let me explain the process to make the table of content. First, you need to apply headings to Chapter names, Topics names and Subtopics names, etc. from Styles group, which is appeared in Home Tab. Then you need to go to the References tab, the first option you can see Table of Content by clicking here you can see the built-in style. After you selected any style where ever the cursor is there Table of content created over there automatically. After created Table of Content, if any topic or point you have added willing to show it in the Table of content, you need to update the table by left click at the top of the table and update it. If you want to remove any point from this table of content, you need to change that content to normal from Styles group and update the table.

2.2.6.2 Remove Hyperlinks :

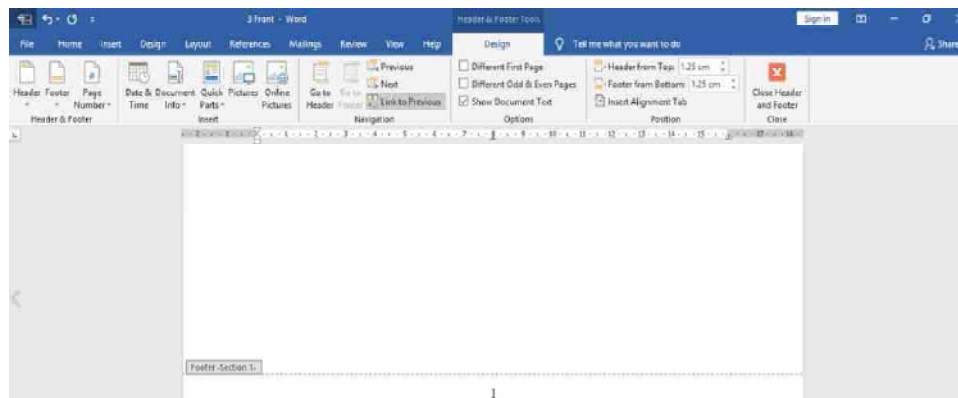


Sometimes you are coping some content from the internet. It may have been showing Hyperlink the moment you take the cursor to the word, which is linked to any other websites. You can remove it quickly by right click in that particular word then select to remove Hyperlink. Still, if you want to delete all the

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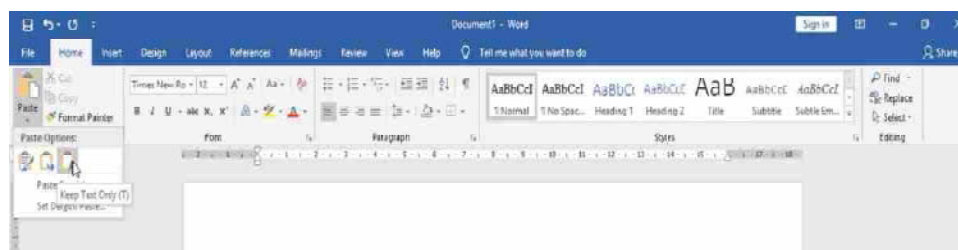
Hyperlinks of your Microsoft word file, you need to select all content (Ctrl/Command + A) then followed by (Ctrl/Command + Shift + F9) shortcut keys.

2.2.6.3 Insert the page number from Chapter 1 :



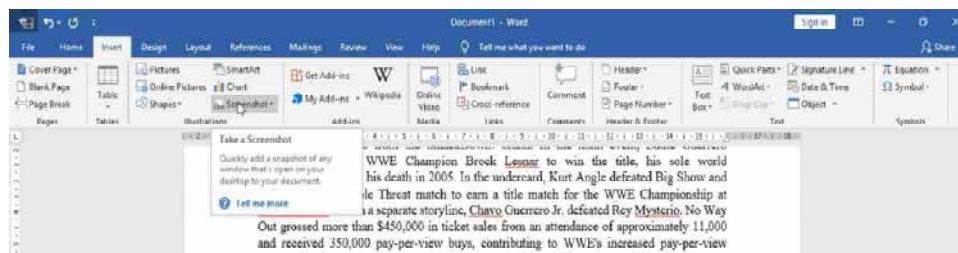
Inserting the page number from Chapter no one is not so easy until you have not discovered the trick. We required to do so because, most of the time, we have acknowledgement, preface, and table of content, etc. before chapter no 1. To insert page 1 in chapter 1, you should go to chapter 1 first page and click the cursor In front of the name of the chapter name then go to Layout Tab and click on the break you will get a lot of options under this but go to section break and select the next page option. After that inserted the page no, the Design tab will be activated from this you need to click on Link to Previous under the Navigation group. In the Design tab, go to page number followed by format page number, then select start at 1, hit enter. Now it organised the page No the way you want.

2.2.6.4 Paste Special :



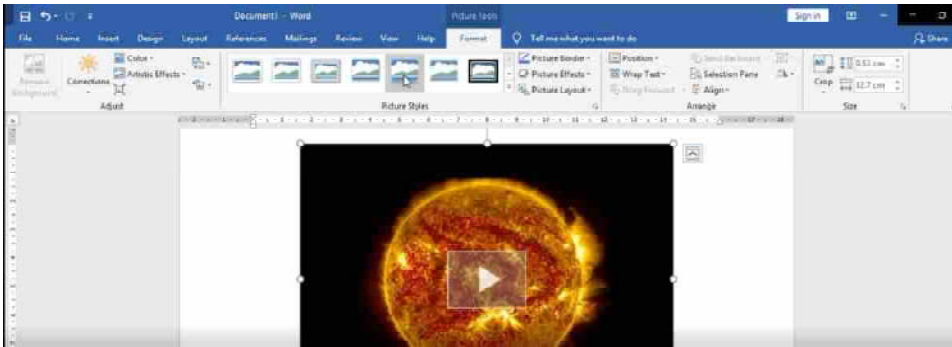
Paste Special is a tool that helps the user to speed up the editing process. It is available in–Home tab in the Clipboard group. Once you copied some content from another source, this option will be available to you. From these three options – Keep source formatting, merge formatting and Keep text only, you can select any one which is best suitable for your need.

2.2.6.5 Screenshot :



A screenshot is a popular tool you may hear in your mobile or your keyboard, but this tool is also available inside Microsoft word 2016 onwards. To use this tool, you need to go to Insert tab, followed by the illustration group and select screen clipping.

2.2.6.6 Customizing the Video :

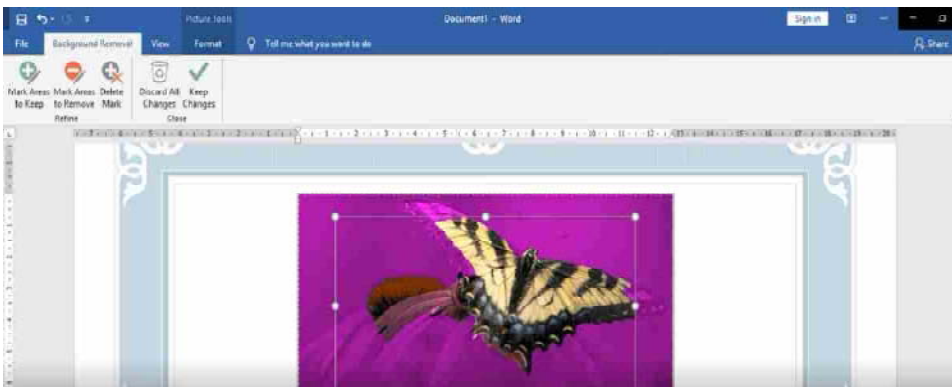


Microsoft word has an inbuilt power full tool which allows you to Customize the Video you inserted. After you have embedded, the video picture tool with format option will be available to you to customize the video.

2.2.6.7 Format painter :

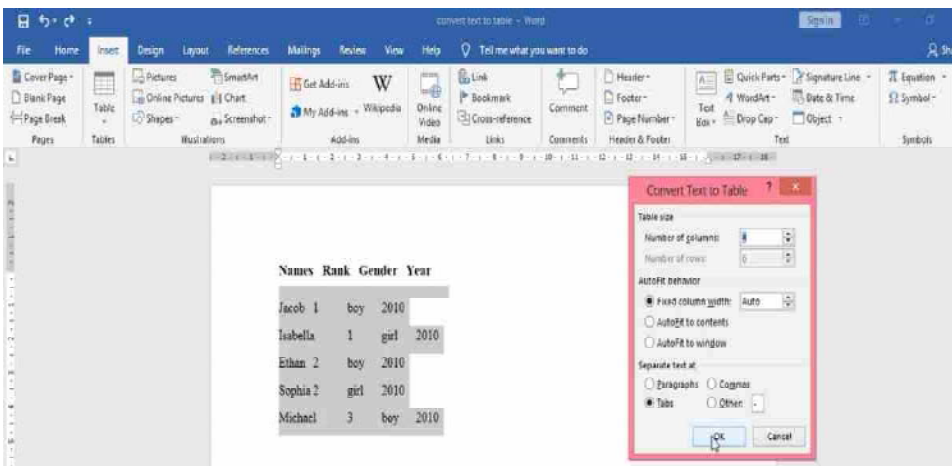
I hope you have been using several times while making a document. If you have several places to apply specific formatting you should double click format painter, to get them out of format painter just press Esc key.

2.2.6.8 Remove background :



Before these, people are learning photo editing software to remove background, but Microsoft word has an inbuilt tool to remove background from any image. To use this tool after you inserted image Picture tools with format tab available to the user, then go to the first option to remove the background. Then mark the areas you want to keep or mark the areas to remove, followed by keep changes button to remove the background.

2.2.6.9 Convert text to table :



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It is an excellent facility available here without going to excel. You can easily convert your text to the table inside Microsoft word only. Select the text you want to insert table the go-to insert and select convert text to table by selecting separate text at followed by the ok button.

❑ Check Your Progress – 1 :

- Which one of these is an example of an open–source application as a word processor ?
(a) Apple Pages (b) InCopy
(c) Microsoft word (d) LibreOffice Writer
- Which one is the extension of the new Microsoft word file ?
(a) .doc (b) .docx (c) .txt (d) .pptx
- _____ utility that allows you to highlight the wrong word.
(a) Underline (b) Spell checker (c) Thesaurus (d) Word Art
- WPS Office Software is a product of _____.
(a) Microsoft (b) Kingsoft (c) Adobe (d) Apple
- Among these, which word processor allows you to select the skin as for your mood ?
(a) WPS Office Writer (b) LibreOffice Writer
(c) FocusWriter (d) InCopy
- Among these, which word processor fades everything into the background except the current paragraph or sentence ?
(a) WPS Office Writer (b) LibreOffice Writer
(c) FocusWriter (d) InCopy
- Among these, which word processor has three viewing modes ?
(a) WPS Office Writer (b) LibreOffice Writer
(c) FocusWriter (d) InCopy
- Among these, which word processor is from Apple Inc ?
(a) WPS Office Writer (b) Pages
(c) FocusWriter (d) InCopy
- Which word processor is the latest from Microsoft word ?
(a) Word 2017 (b) Word 2018 (c) Word 2019 (d) Word 2020
- _____ is the short cut to remove all hyperlink from the document.
(a) Ctrl + C (b) Ctrl + V
(c) Ctrl + Shift + F9 (d) Ctrl + Shift + F8

2.3 LET US SUM UP :

To choose word processor we should consider the configuration of your computer followed by your requirement. We should always concern about the features you are looking in word processor and select best word processor suitable for your needs.

Note that All the updates mentioned in this chapter are up to date till 1st July 2020.

2.4 ANSWERS FOR CHECK YOUR PROGRESS :

1. LibreOffice Writer
2. .docx
3. Spell checker
4. Kingsoft
5. WPS Office Writer
6. FocusWriter
7. InCopy
8. Pages
9. Word 2019
10. Ctrl + Shift + F9

2.5 GLOSSARY :

Insert text : Allows the user to insert text anywhere in the document that may be online or offline.

Delete text : Allows you to erase alphabet, words, lines, or pages as quickly as you can clean from the blackboard.

Cut and paste : cut from one place or file and paste it in different location.

Merges : it allows the user to extract information from another file into one file.

Subscription : Paid in advance for a thing for a specific period.

2.6 ASSIGNMENT :

Make a word file by following instruction.

Page Set Up

Margin

Top 2.6 cm Bottom 2.6 cm

Left 2.5 cm Right 2.5 cm

Orientation of the page

Portrait

Pages

Mirror margins

Paper

A4

Layout

Click : Different odd and even

From edge :

Header 2 cm Footer 2 cm

Paragraph

Alignment : Justified

Outline level : Body Text

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Indentation

Left 0 cm Special

Right 0 cm First line 1.5 cm

Spacing

Before 6 pt Line Spacing

After 6 pt Multiple 1.3 cm

Font

Times New Roman, Heading Bold 14 and topic name bold 16.

2.7 ACTIVITY :

Use at least two-word processor to find out the new features and make a note of the Positive and Negative Aspects of the Word processor.

2.8 CASE STUDY :

Mr. Rout is working in a company where all his colleague is using Microsoft word, but he is using open source software facing a lot of problems. He is not having enough money to buy the Word 2019. According to you, what Mr. Rout must do.

2.9 FURTHER READING :

<https://www.wps.com/writer>

<https://www.libreoffice.org/discover/writer/>

<https://gottcode.org/focuswriter/>

<https://www.adobe.com/in/products/incopy.html>

<https://www.apple.com/in/pages/>

<https://www.microsoft.com/en-in/microsoft-365/word>

Office 2010 All-in-One for Dummies by Peter Weverka



UNIT STRUCTURE

- 3.0 Learning Objectives**
- 3.1 Introduction**
- 3.2 Let's Discuss a Few Popular Spreadsheet Programs Below**
 - 3.2.1 Airtable**
 - 3.2.2 Ethercalc**
 - 3.2.3 Zoho sheet**
 - 3.2.4 Libreoffice Calc**
 - 3.2.5 Google sheets**
 - 3.2.6 Apple numbers**
 - 3.2.7 Microsoft Excel**
- 3.3 Let's Learn a Few Advance Formulas Used in Microsoft Excel**
 - 3.3.1 Custom date**
 - 3.3.2 Mround option**
 - 3.3.3 Concatenate**
 - 3.3.4 Vlookups**
 - 3.3.5 Name range**
 - 3.3.6 Text**
 - 3.3.7 Counta**
 - 3.3.8 FV function**
 - 3.3.9 PMT**
 - 3.3.10 AND**
 - 3.3.11 Nested formula**
 - 3.3.12 Change Case in Excel**
 - 3.3.13 Formula auditing**
 - 3.3.14 Flash fill**
- 3.4 Let Us Sum Up**
- 3.5 Answers for Check Your Progress**
- 3.6 Glossary**
- 3.7 Assignment**
- 3.8 Activity**
- 3.9 Case Study**
- 3.10 Further Reading**

2.0 LEARNING OBJECTIVES :

From this chapter, you understand the spreadsheet and spreadsheet programme, free and paid spreadsheet software available in the market, standard tools provided by the spreadsheet so that you can easily select the spreadsheet programme, which is best suitable for your needs.

3.1 INTRODUCTION :

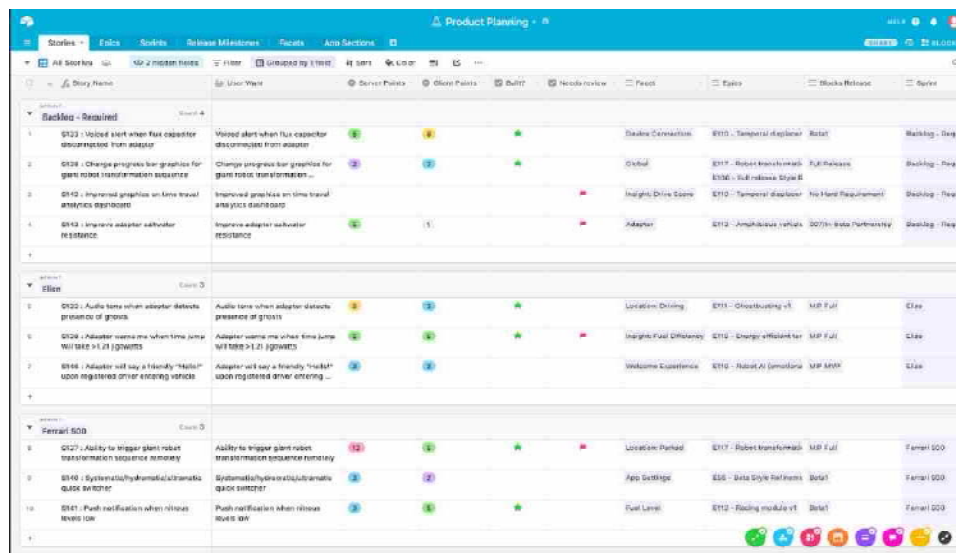
In the old age, the business community was using Ledger paper, which was having "A" grade quality like bond paper. For durability, it typically manufactured in higher basis weights, which is very well known as today is called GSM (Grams per Square Meter). It used as a legal document and record keeping. Few examples of legal forms such as a bond, wills, deeds, etc. just because of intention to keep long duration the Paper qualities are high strength, stiffness, and a surface suitable for pen and ink, erasing, and computer printing devices. The finishing of the paper may be smooth or slightly roughened is called a posting finish. It is excellent for the machine posting of data. Ledger papers are made from cotton pulp because it is known to last many years without deterioration. The quality of the Cotton paper is superior in both strength and durability. The standard sizes of Ledger paper are 11 x 17 inches.

The user started using Spreadsheets to keep the data electronically, which help to store and manage data in the cells, which represent in the form of rows and columns. You can save the input data and manipulate it as it requires. It's beneficial to manage the numbers, and its related data in some manner like add, subtract, multiply, divide, and other mathematical functions along with sorting, filtering, etc.

Most of the user who wants calculation like accounting and finance are use this program the most often in a professional context. The spreadsheet is a common term that may use different software programs like Microsoft excel, google spreadsheets, Apple works, etc., among these most popular is Microsoft excel.

3.2 LET'S DISCUSS A FEW POPULAR SPREADSHEET PROGRAMS BELOW :

3.2.1 Airtable :



Operating system : Web, Android, iOS

As for the name suggest, it is a cloud collaboration service started in 2012 by Howie Liu, Andrew Ofstad, and Emmett Nicholas in San Francisco. Airtable is database software using a spreadsheet interface. Spreadsheets used as a base, which should give you some idea of the product's intended use. It is available with some necessary spreadsheet tools, which cannot access in the usual way.

It loaded with a lot of templates that help the user to understand the product and its utilisation. Most of the cases, you can get ready-made templates for product planning flow charts, product launch checklists, sales and CRM solutions, and even video production storyboards.

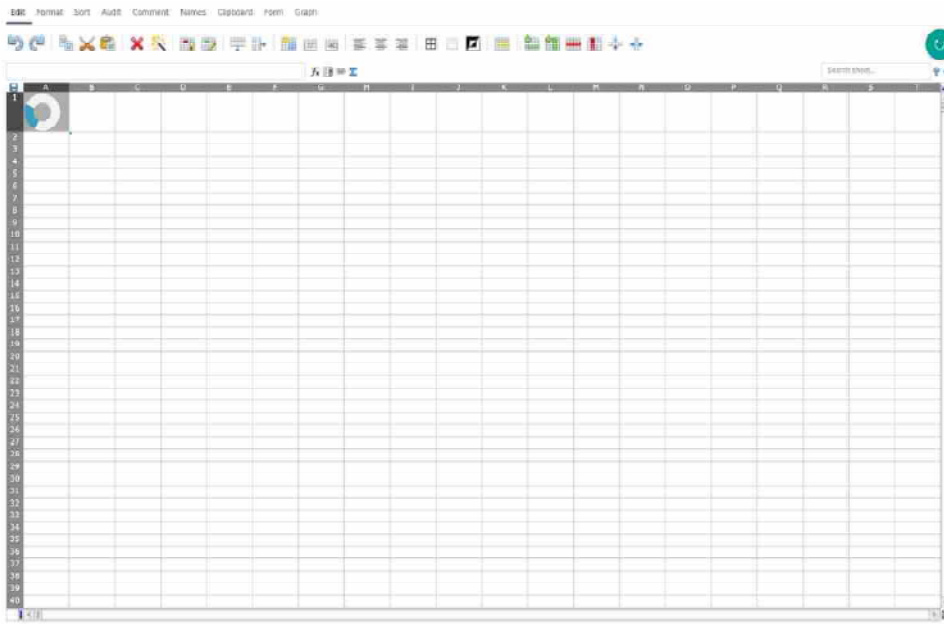
As it designed as the database management software in concern, The columns are "fields," which are similar to cells in a spreadsheet, and rows are "records." To view the fields for the entire record, you need to click on a row. You can customise the field for your needs. For restriction, the user can't change fonts or sizes, but you can select from a variety of options, including checkbox, date, URL, bar code, and more.

You may use as a spreadsheet for writing the formulas, creating graphs and pivot tables from the data given, looking up records in your base, and summarising values. You can also add the content from another web page into a dashboard you have created or manage an editorial workflow (editor's note : we use it for that exact purpose at Zapier).

It may not be another option for spreadsheet software, but yes, you will get a lot of things you always wish in spreadsheet software cannot do.

The Price for Airtable : Free plan available; from \$12/user/month for 5,000 records/base, 5GB/base, and six months snapshot history.

3.2.2 Ethercalc :



Operating system : Web, GNU/Linux, FreeBSD, Mac OS X and Windows

Ethercalc developed by Dan Bricklin. The name itself defines it's a combination of ethernet and calculation, which means to connect and calculate. Just because it is a web-based platform, you can access this spreadsheet software through any browser like you are browsing any websites. To access, it doesn't

Computer Reservation System

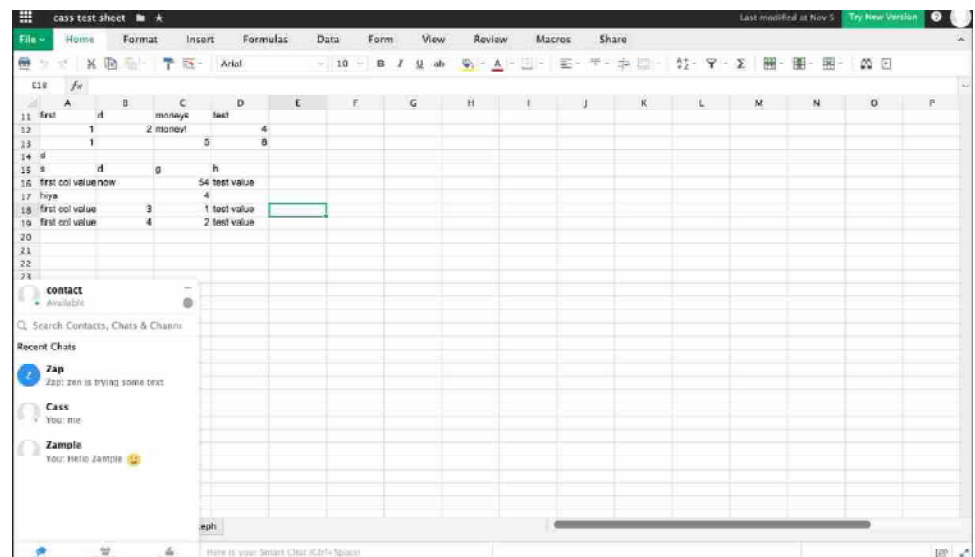
require any login. If you know the networking process, you can host EtherCalc from your server and make it available to local users or wide area network users.

Timesharing features allow all users to work on different sheets at the same time. Each sheet has a distinct URL. It makes the work easier for the collaborator because copying the URL of a specific sheet and sharing it with the specified person to access it and enter the data to it. It does not require any password to access it or connect it with any cloud hosting to facilitate the user.

It is perfect for collecting the data from multiple users, but it does not have advanced features, like conditional formatting. Due to the non-familiar user interface (UI), the user may face the problem to discover it ultimately. Basic graphing and fewer tools help it to work faster but genuinely speaking it does not design for the complex project.

EtherCalc Price : Free.

3.2.3 Zoho sheet :



Operating system : Web, Android, iOS

To use this Zoho Sheet, you need to go to the official website and create a Zoho Account. It is similar to Google Sheets but has more features in it. You can select Sign up for free or sign in using google account, Facebook account, LinkedIn account, or Microsoft account.

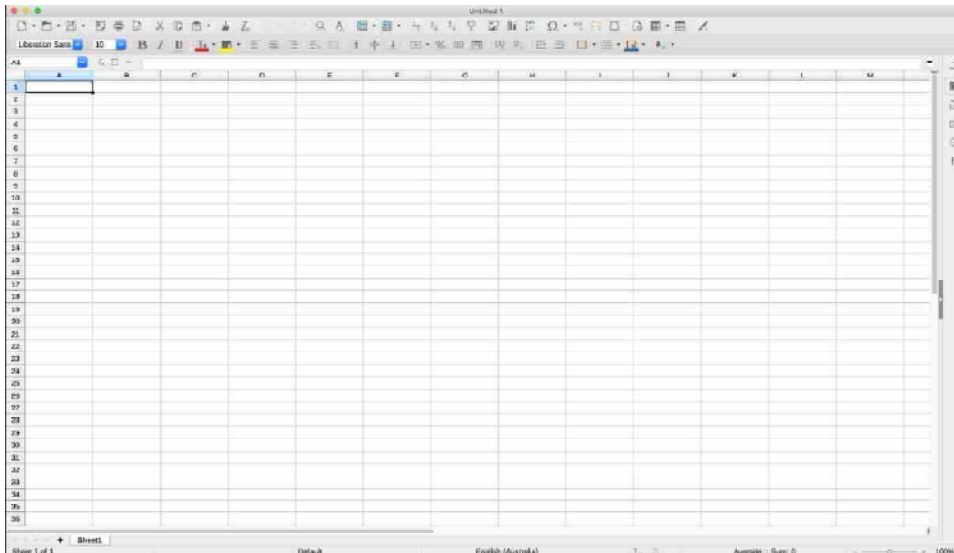
Around 350+ functions are available in Zoho Sheet to handle necessary arithmetic calculations to complex calculations with the help of it. To use advanced services like conditional formatting, pivot tables, and data validation supports are available. You can import the data from external sources by uploading it.

A powerful tool called Deluge allows the user to create custom functions. It's so simple and easy for non-programmers also. Just drag and drop elements into the editor, with a single line of code stating the action to perform.

Sheet includes real-time collaboration via the Share menu. To discuss the task with another user, just click the chat box at the bottom of the window or leave the comments. It's simple to managing sharing permissions and to publish your whole spreadsheet or specific ranges on the web under Share > Publish.

The user can try it free : Free plans available for five users in which per user can get 5GB cloud storage; business subscriptions are also available.

3.2.4 Libreoffice Calc :



Operating system : Windows, macOS, Linux, Android

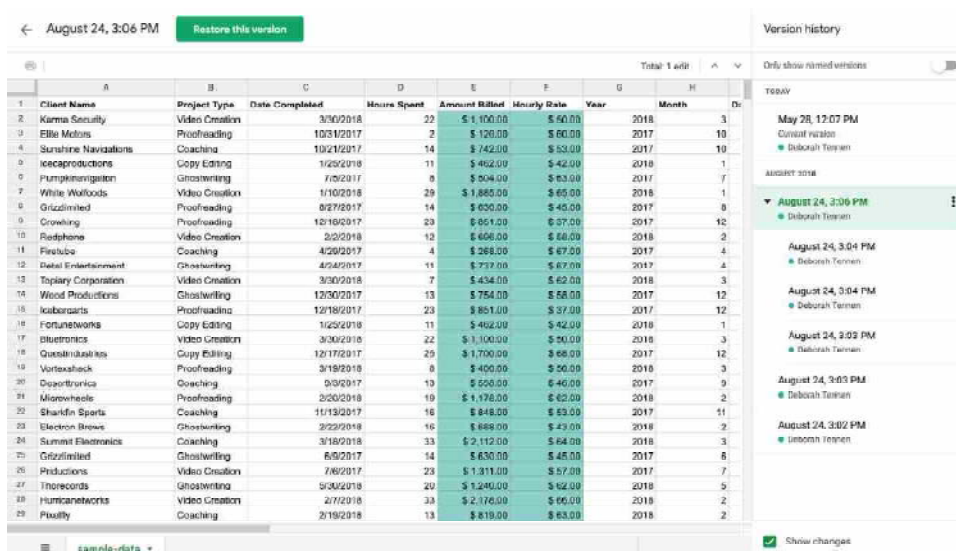
LibreOffice is a Free and not-for-profit organisation. It's welcome all new talent and new ideas to develop open-source software. This use by many users and developed by the developer around the globe.

Calc is one of the spreadsheet software of LibreOffice. If you are a new user, you may feel comfortable learning, and professionals appreciate the advanced functions. To use advanced features, the user can take the help of Built-in wizards. You can download the ready-made template for your need. It's completely free with almost all the features that a modern spreadsheet software should have.

To compare net profit for 2017, 2018 and 2019 on the base of sales forecasts, you can use the Scenario Manager. You can add the regular function to the interface along with the assigning the keyboard controls for reaching to the app, which improves the performance of the user.

The collaborative feature allows multiple-user support. By sharing different spreadsheet to another user can easily add their data to it. The spreadsheet administrator can then easily compile the new data in just a few clicks. This collaboration feature helps to avoid editing conflicts.

3.2.5 Google sheets :



Computer Reservation System

Operating system : Web, iOS, Android

With Google account, you can use Google Sheets free of the cost. It's popular quickly because most of the computer users are using Google services like Gmail. It's combined with all the other Google apps you may use, including Google Analytics, Google Data Studio, and Google Forms. You can accumulate the data from google form to google sheet. Even you can create google form from google sheet by installing an additional addon. The addon facility makes the google sheet more potent than what you thought.

To make it more powerful, Google has added GOOGLE TRANSLATE and GOOGLE FINANCE services with google sheet. It's free yet loaded with powerful features like pivot tables and conditional formatting. You can select from a wide range of budgets, schedules, and other pre-made spreadsheets. Only the basics functions are available in the interface, but by going to the different menu or clicking the down arrow icon near the tools, you can open additional options.

The collaboration features : Work on spreadsheets together in real-time, see what your co-workers are doing as they do it, and leave comments for others to follow up. Just because it is on the web the moment, you do some modification to the existing file it may update the version also. Still, you can see a version history of your spreadsheets that allow the user to revert to any previous version.

Google Sheets also available for business users starting at \$6/user/month. You can connect Google Sheets to 1,500+ other apps with Zapier's Google Sheets integration.

3.2.6 Apple Numbers :

Operating system : macOS

Apple numbers is a pre-installed free spreadsheet programme coming with Mac. Numbers is a proficient spreadsheet app with a user-friendly tilt. It has real-time collaboration, can create beautiful charts and graphs, and comes with enough templates to get you started for most common office tasks. It does not support to handle huge data sets, and it lacks many of the advanced features like Microsoft excel. But the simple user interface and an unbeatable price tag make it popular among the user for basics work. To create personal budgets, invoicing clients, or working out math problems, you may use TableEdit tool to make it simple.

3.2.7 Microsoft Excel :

Operating system : Web, Windows, Mac, Android, iOS

Microsoft Excel is the most popular spreadsheet programme in the world. Just because it has frequently been using by most of the users and organisation the demand graph is continuously increasing. It's now available for both desktop applications and as a web application, which is a part of the Office365 subscription service.

If you compare Microsoft Excel with any other spreadsheet software, it's the best spreadsheet programme to date loaded with a lot of functions and features than any other spreadsheet software. It's efficient to handle larger spreadsheets, too, with a maximum cell count of 17,179,869,184—in case ever need it. If you're working with huge data sets, Excel will handle it better than any competitor. The powerful filters at the top of each column allow the user to bifurcate or select from the huge database. The INDEX-MATCH Functions let you segregate records from a large range.

In addition to a wide range list of functions, Excel predominant features like conditional formatting and pivot tables. The macros allow the user to record the steps you have been doing or use Visual Basic for Applications (VBA) to speed up your workflow with one-click scripts massively. To start it, click on View Tab > Macros > Record Macro. You can give it a name and assign a shortcut for it, select the specific location to store it, then hit OK and record your script.

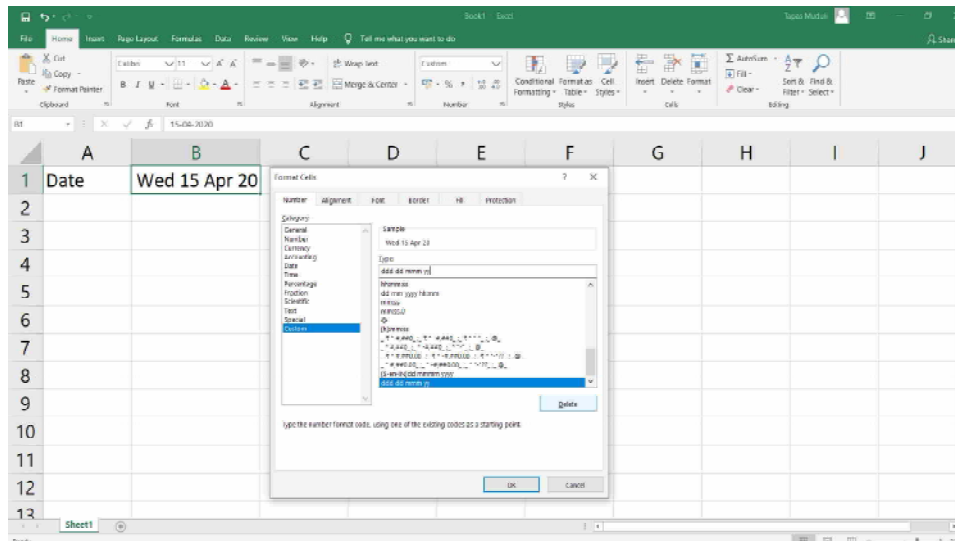
The interface has changed a lot over the years, too, with a customizable Quick Access toolbar for holding useful functions you need to access frequently. If you compare google sheet with Microsoft excel web app, for calculation, google sheet has to send the data to the server. In contrast, Microsoft excel dose it within itself, which results in better performance.

Microsoft Excel's collaboration features are only available with an Office365 subscription, which includes other applications too. Facilitate to work other Excel users in real-time and access document versioning to roll back changes if need be. The new extension of the new Microsoft excel file is .xlsx, whereas the old one is .xls. it's also allowed the user to save it in the cloud server if you have connected to the internet.

You can go for Office365, which is subscriptions based or purchase a single Excel license outright for \$149.99 (not including collaboration) as suitable to you or your organisation.

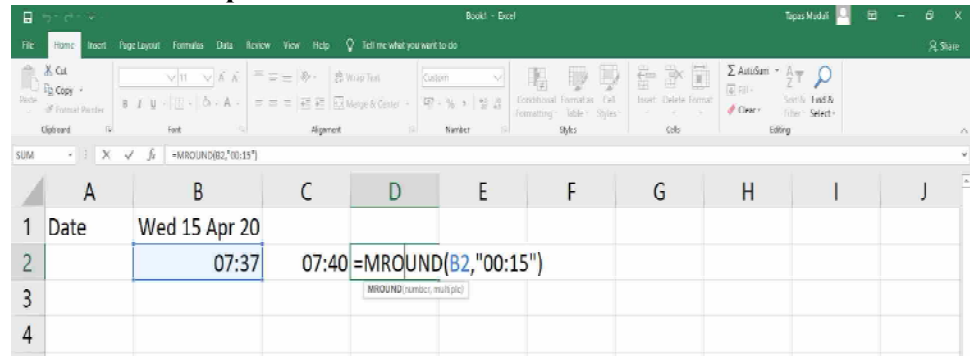
3.3 LET'S LEARN A FEW ADVANCE FORMULAS USED IN MICROSOFT EXCEL :

3.3.1 Custom Date :



In excel if you enter any date in any cell automatically excel, consider that cell as Date formatting. If you want a specific style, you need to right-click where you entered the date then select format cells. It will open the format cells window, allow the user to select predefined type under the date category. If you want different type than the listing type, you need to select custom. Take an example you want to write Wed 15 Apr 20, to write this in custom under the type you need to type (ddd dd mmm yy). The command represents as follows : ddd-Day, dd-Date, mmm-first three-letter of month and yy- year last two-digit.

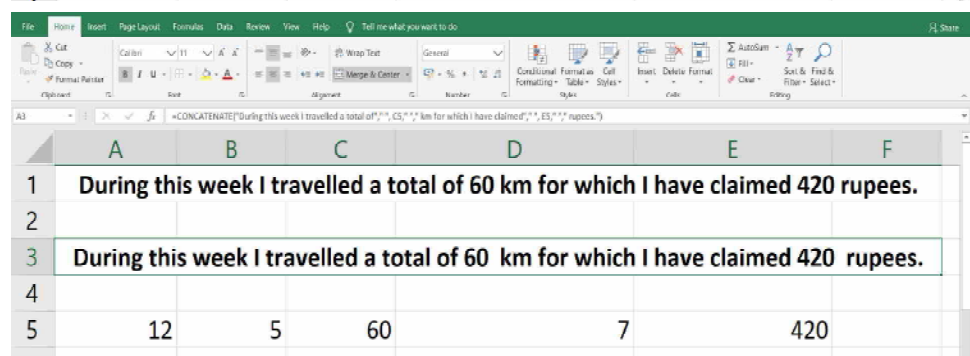
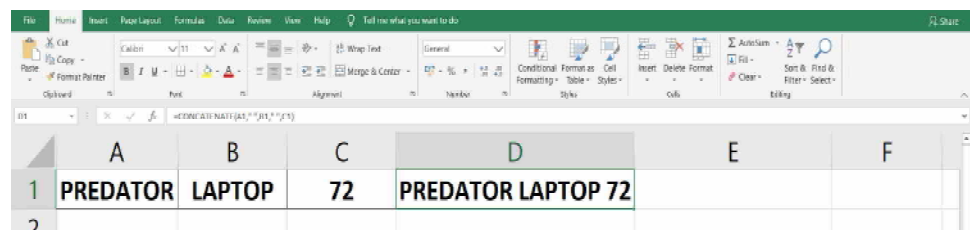
3.3.2 Mround Option :



If you want to round up the work hours, you should use MROUND function to roundup closely to fifteen minutes. The syntax of this function is =MROUND(number, multiple). The number represents the cell you want to format followed by multiple to it.

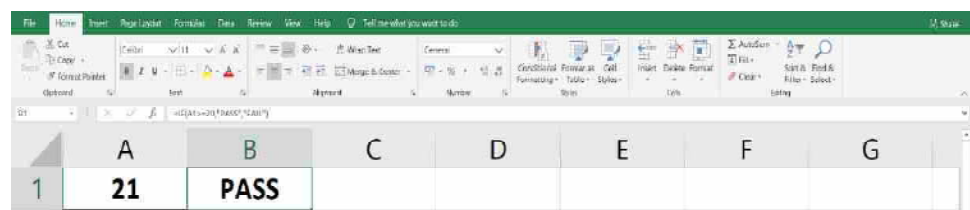
3.3.3 Concatenate :

It's a function used for joining the text in different cells into one text. It's also allowed the user to join constant and variable data to produce meaningful information. You need to write the constant in between inverted comma and variable without the inverted comma. However, you need to separate both by using a comma only. The formula for concatenate is =concatenate(text1,text2,text3,etc) but for the case it would be =concatenate("text1",text2,"text3",etc). if you want space in between two string you may use " ", by leaving the space in between inverted comma.



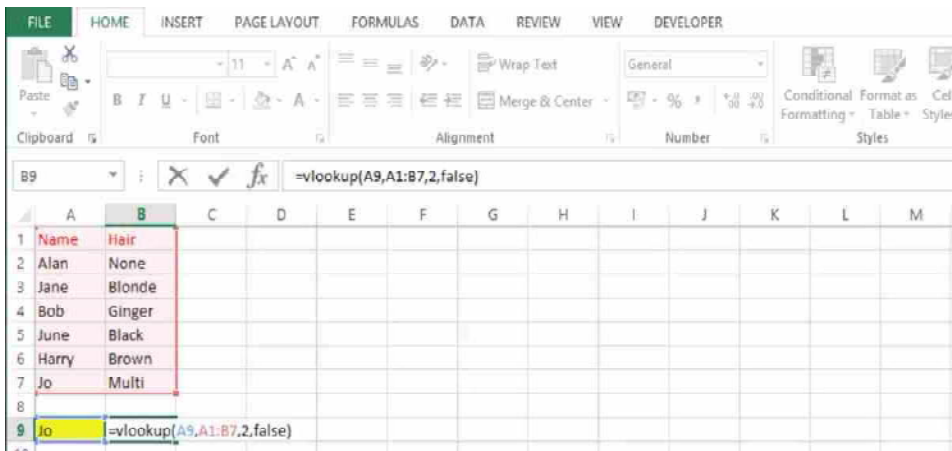
IF

It is a logical function generally use by the user to find out return a value as true or false on the base of the argument.



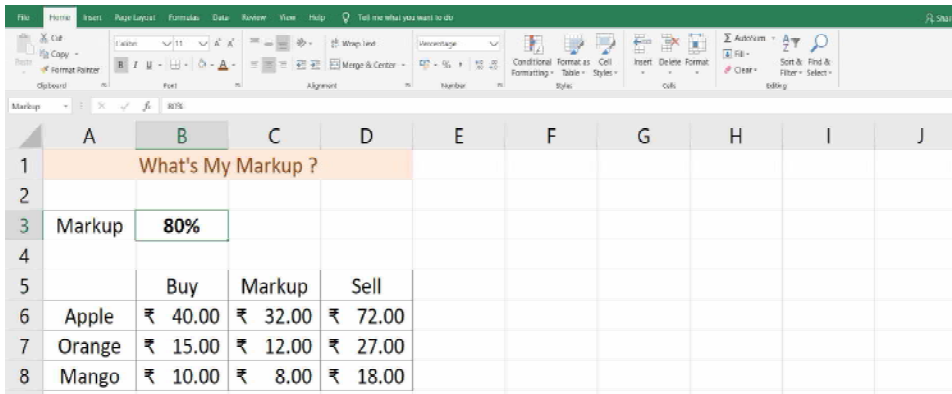
3.3.4 Vlookups :

VLOOKUPS function used by Advance users frequently to fetch the data from the table by specifying column number and resulting by looking to the lookup value. Here lookup value means what particular data you want to find as a user.



3.3.5 Name Range :

In excel, every cell has an address. To use that particular cell in the function, we should remember the cell address. Most of the user is dragging the formula to use it in the cell they wanted but by having the name of that particular cell help the user to remember it and use in pulling without changing the cell address. To get rid of the name range you need to go to the formulas and select name manager. This name manager is showing all the name range you created listwise from the list you can delete it or edit it.



3.3.6 Text :

The text function allows the user to convert a value to text in a specific number format.



3.3.7 Counta :

It is a function generally use by the user to count the exact number of entries from the large selection. Let me give an example where you can utilise this function. If you want to make a list of all the students in your class and you

Computer Reservation System

want to excel to count the total number of students automatically, this is the best option you can use for that.

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I
1	Total No of Students	4							
2									
3	Student Name								
4	Sagar								
5	Sameer								
6	Shakhi								
7	Divyasha								
8									

3.3.8 FV Function :

The expanded form of FV is Future Value. It is a financial function that returns the future value of an investment. If you invest a particular amount of money want to know how much amount you will get after a certain period, you can use this FV function. The formula is =FV(rate, nper, pmt, [pv], [type]). To understand the function, go through the illustration below.

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
3	Present value			₹ 10,000.00												
4	Interest rate			8.50%												
5	Term(Years)			8												
6	Compounding periods per year			12												
8	Future value			=FV(D4:D6,D7*D8,D9,D3)												

FV function is a financial function that returns the future value of an investment

rate - The interest rate per period
nper - The total number of payment periods
pmt - The payment, made each period. Must be entered as a negative number
pv - [optional] The present value of future payments. If omitted, assumed to be zero. Must be entered as a negative number.
type - [optional] When payments are due. 0 = end of period, 1 = beginning of period. Default is 0

3.3.9 PMT :

It is a financial function, used by most of the users to calculate how much total money you need to pay at the end of the year or after a certain period. Now a day, most of the people around the world are purchasing the product on EMI. If you have the information about the interest rate and the duration you have taken for EMI, you can easily calculate how much money you need to pay at the end of the duration. To know the total amount, you can use the PMT function.

The screenshot shows an Excel spreadsheet with the following data:

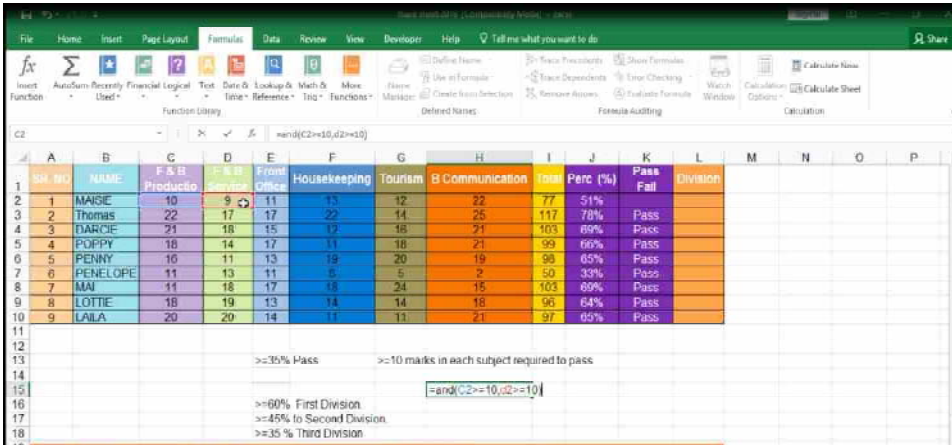
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
23	Present value			₹ 35,000.00												
24	Interest rate			8.50%												
25	Term(Years)			1												
27	Payment per Year			=PMT(D4,D23,D25,D23)												
28	Payment per Month			0.00												

PMT = (Rate, Nper, PV, [FV], [Type])

Rate = It is the interest rate/period
Nper = Number of periods
PV = Present Value
[FV] = An optional argument which is about the future value of a loan (if nothing is mentioned, FV is considered as "0")
[Type] = When the payment is made (if nothing is mentioned, it's assumed that the payment has been made at the end of the period)

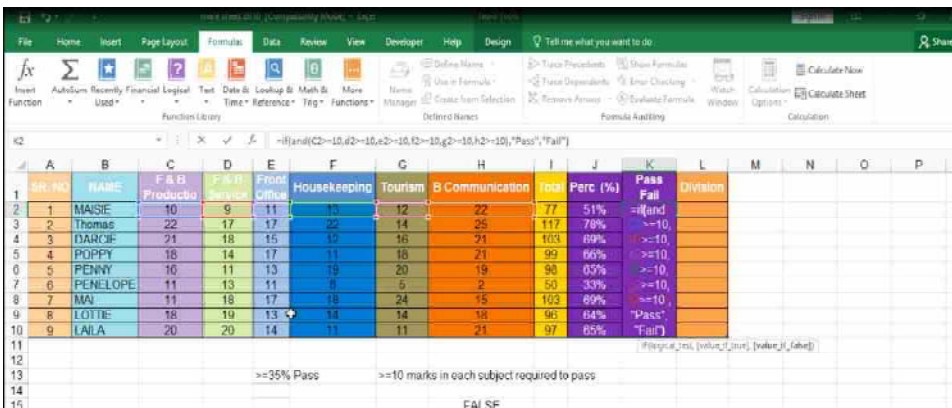
3.3.10 AND :

AND formula coming under logical function. AND check all the arguments are correct and return TRUE if all the arguments are right. More than one argument enters by the user where the user wants to show TRUE if all the arguments are valid by chance anyone argument is not correct; it should return the value FALSE.



3.3.11 Nested Formula :

In Excel, if you use more than one formula in a single cell, it is called Nested Formula. You can use various formulae together many times to acquire the desired result. It is a little complicated to use because you should know all the formula and their utilisation at the same time should know to a club with which formula to work. Here in this illustration, you want to know whether the student is pass or fail from the basis of various subjects' marks.



3.3.12 Change Case in Excel :

Like in Microsoft word, we have the formula in excel under text function to change the case. If you want to write everything in the capital you should use =UPPER(cell address). If you want to write everything in small, you should use =lower(cell address). If you want to write everything in sentence case, you should use =proper(cell address). These are the functions that help you to speed up the formatting to text.

3.3.13 Formula Auditing :

To have a better understanding of formula the user is using the formula auditing group which is coming under the formula tab. Trace precedents function under formula auditing helps the user to find out the participant cells value used in that formula whereas in Trace dependents help the user to find out the single cell is a part of which formula. Whether you are using Trace precedents or Trace

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dependents excel creates arrows to indicate the cell to remove the arrows just click on remove arrows.

SR. NO	NAME	201	202	203	204	205	206	207	208	Total	Perc (%)	Rank	Remarks
1	MAISIE	19	45	17	32	36	27	26	34	238	48%		Fail
3	Thomas	19	45	17	22	36	25	28	34	226	45%		Fail
4	DARCIE	19	45	17	12	36	45	28	34	236	47%		Fail
5	POPPY	19	45	17	11	36	27	28	34	217	43%	I	Pass
6	PENNY	19	45	17	19	36	27	28	34	225	45%		Fail
7	PENELOP	19	45	17	20	36	27	28	34	226	45%	II	Pass
8	MAI	19	45	17	32	36	27	28	34	238	48%		Fail
9	LOTTIE	19	45	17	32	36	27	28	34	238	48%	IV	Pass
10	LAILA	19	45	17	32	36	27	28	34	238	48%		Fail

3.3.14 Flash Fill :

Flash fill, which is available under the data tab, helps the user to do the formatting in a specific format to a large volume of data. After you have formatted the first cell and clicked on flash fill the rest of the cells follow the formatting of the first cell.

Phone No
9913551366 (991) 355-1366
9876542345 (987) 654-2345
8065430213 (806) 543-0213
5436789023 (543) 679-9023

□ Check Your Progress – 1 :

- GSM stands for _____.
 - Gain per Square Meter
 - Grams per Square Meter
 - Grams per Square Mile meter
 - Grams Square Meter
- The standard sizes of Ledger paper are _____.
 - 8.26 X 11.6 inches
 - 8.5 X 14 inches
 - 12 X 17 inches
 - 11 x 17 inches
- In Airtable the columns are called _____.
 - Records
 - Cell
 - Data
 - Fields
- Among these, which is not a Web-based platform.
 - Airtable
 - EtherCalc
 - Zoho Sheet
 - LibreOffice Calc
- Among these which one is the popular spreadsheet programme in the world.
 - LibreOffice Calc
 - Google Sheets
 - Microsoft excels
 - Apple numbers
- _____ is a spreadsheet programme from Google.
 - Google Analytics
 - Google Sheet
 - Google Data Studio
 - Google Forms

7. _____ allows multiple users to work at the same time.
(a) Sharing (b) Collaborator (c) Multitasking (d) Online access
8. _____ is a cloud collaboration service started in 2012 by Howie Liu, Andrew Ofstad, and Emmett Nicholas in San Francisco.
(a) Airtable (b) EtherCalc
(c) Zoho Sheet (d) LibreOffice Calc
9. Ethercalc developed by _____.
(a) Howie Liu (b) Andrew Ofstad
(c) Emmett Nicholas (d) Dan Bricklin
10. UI stands for _____.
(a) User interface (b) Ultimate interface
(c) User internet (d) Useful information

3.4 LET US SUM UP :

Microsoft Excel is the most advanced spreadsheet programme which helps you to make complicated excel sheets because it is loaded with lots of features. This is also one of the spreadsheet programme which has accepted by most of the company of all the size.

3.5 ANSWERS FOR CHECK YOUR PROGRESS :

1. Grams per Square Meter
2. 11 x 17 inches
3. Fields
4. LibreOffice Calc
5. Microsoft excels
6. Google Sheet
7. Collaborator
8. Airtable
9. Dan Bricklin
10. User interface

3.6 GLOSSARY :

GSM – Grams per Square Meter

Browser – A small piece of software used for accessing the internet.

Timesharing – The features allow all the users to work on a different sheet at the same time.

UI – User interface

Deluge – A powerful tool called Deluge allows the user to create custom functions in Zoho Sheet.

3.7 ASSIGNMENT :

Create an Excel sheet by using the above formulas and functions for your Home.

3.8 ACTIVITY :

Imagine you are the class teacher of standard 11th in Holy Spirit schools. It is compulsory to make a mark sheet for the student in excel. Use the formula to automate the mark sheet so that it helps to produce the mark sheet quickly.

3.9 CASE STUDY :

Stay Fit is an Ahmedabad, Gujarat based company. It scientifically designed with modern equipment provided personal training, group training, Zumba dance with new fitness concept that is taking the nation to a new level of physical as well as mental fitness and growing at a massive rate.

As the demand for Stay Fit increased, they started distributing the franchise, it was not clear the current process for on-boarding new franchisees, and opening studios was not streamlined enough. The current process was mainly managed by a single Excel workbook that was passed around from user to user to enter the data without security measures concern. Finding a lot of difficulties and errors found as the store expansion was accelerating, the IT department of the company knew they needed a sophisticated solution. They came up with a new idea and subscribed to Office 365. Thought of using SharePoint with Excel, they felt it is easy to work because of Microsoft platform would offer familiarity to current users with enhanced analytical functionality.

What are the factors that need to consider the IT department of the company at the time of designing the excel sheet to make an error-free environment ?

3.10 FURTHER READING :

<https://try.airtable.com>

<https://ethercalc.net/>

<https://www.zoho.com/sheet/>

<https://www.libreoffice.org/>

<https://www.google.com/sheets/about/>

<https://www.apple.com/in/numbers/>

<https://www.microsoft.com/en-in/microsoft-365/excel>

Excel 2019 Bible 1st Edition by Michael Alexander (Author), Richard Kusleika (Author), John Walkenbach (Author)



UNIT STRUCTURE

- 4.0 Learning Objectives
- 4.1 Introduction
- 4.2 Let's Discuss a Few Popular Presentation Programs or Software Below
 - 4.2.1 Canva
 - 4.2.2 Gsuite
 - 4.2.3 Microsoft Power Point
 - 4.2.4 Impress
 - 4.2.5 Prezi
 - 4.2.6 Emaze
 - 4.2.7 Slide Rocket
 - 4.2.8 Haiku Deck
 - 4.2.9 Visme
- 4.3 Preventive Maintenance and Cleaning of Computer
 - 4.3.1 Hardware Preventive Maintenance
 - 4.3.2 Software Preventive Maintenance
- 4.4 Let Us Sum Up
- 4.5 Answers for Check Your Progress
- 4.6 Glossary
- 4.7 Assignment
- 4.8 Activity
- 4.9 Case Study
- 4.10 Further Reading

4.0 LEARNING OBJECTIVES :

From this chapter, you understand the presentation software, free and paid presentation software available in the market, various facilities provided by presentation software should know preventive maintenance, and its utilisation.

4.1 INTRODUCTION :

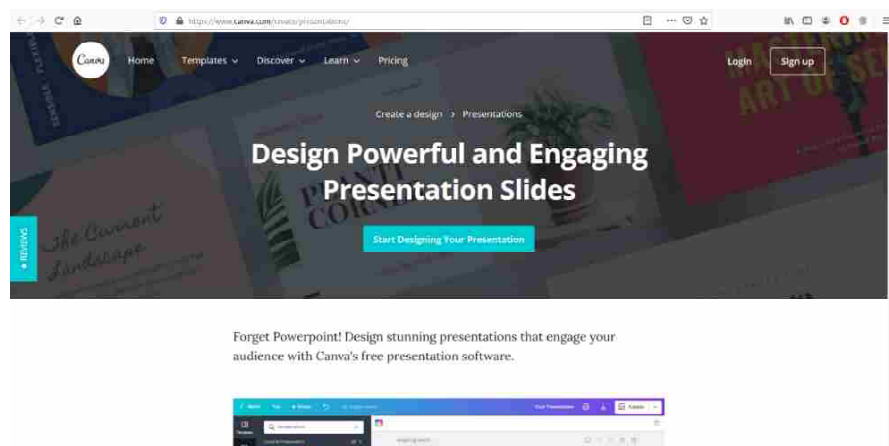
A presentation programme or software widely used to display information in a more presentable way in the form of a slide show. It has three significant features : a text editor that allows the user to insert the text, edit the text, or customised the text, a method of inserting and manipulating images and video, and creating a slide-show to display the content. Most of the users using Presentation software to present their idea or innovative thought electronically, with their own distinct culture and practices as compared to traditional presentation media.

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Generally, in the board room, auditorium, office, and classroom are having a projector and audio system to run a visual presentation that accompanies the slide show. It's easy to convey essential information by a well-designed infographic can be tremendously useful. The professional presentation not only simplifying the things but also connecting the viewer with the fact and figures. The ideas or thoughts accompanying text, image, and animation create an unforgettable impact on the audience. Presentation is an essential part of any business, and therefore the selection of the right piece software is necessary and useful. It is an effective medium through which you are going to propose business ideas and projects to your bosses and clients. Your presentation software should have a feature that allows the presenter to highlight ideas in the best possible manner.

4.2 LET'S DISCUSS A FEW POPULAR PRESENTATION PROGRAMS OR SOFTWARE BELOW :

4.2.1 Canva :

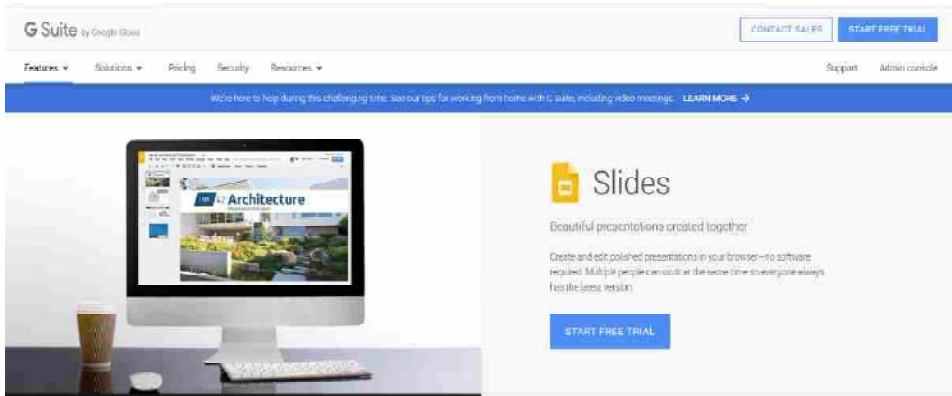


Canva.com makes you Become a visual communicator. If you want a presentation for your work or school, it gives you great design to help your ideas stand out and read effectively. It's loaded with hundreds of well-designed layouts to create presentations on any topic.

- Canva provides free account forever, but with this, you will get limited templates, font, designs, etc. Of course, it has a large number of stock images that can be used to make the content of the presentation more impactful. Most of the images are free of charge. However, premium photos cost nothing more than \$1.
- The great combination of fonts, colours, background, images, etc. which can add related to the content and beautify every presentation. The platform claims 120 typefaces and a wide range of colours, which can be utilised to make the presentation personalised and professional.
- Creating a presentation on Canva is very easy. After opening your account, just log in and open "Presentation" on the dashboard. The platform is equipped with hundreds of professionally designed slides from which you can choose according to the requirements of the project.

4.2.2 Gsuite :

Presentation Program

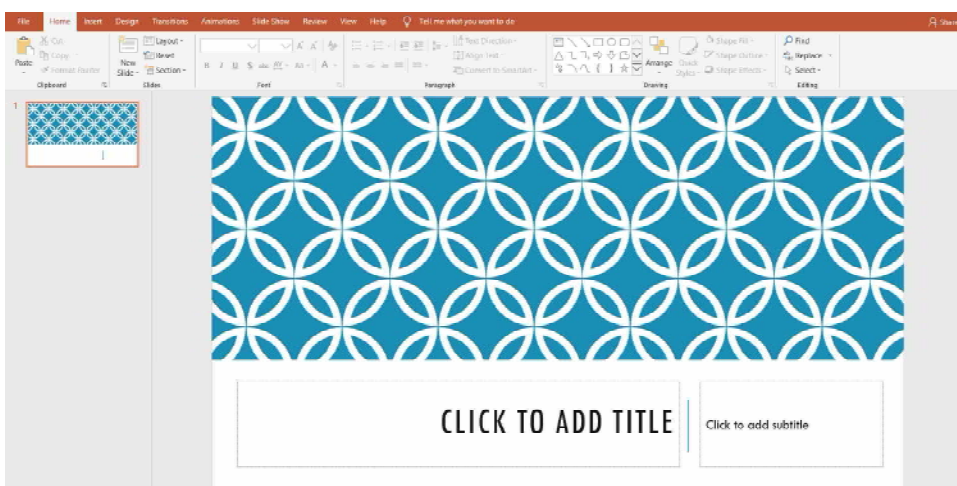


Gsuite by Google Cloud is one of the greatest choices among the user for presentations. The simple interface and access through the browser from any corner of the world, allowing collaboration and teamwork at the same time.

- It is effortless to use because of the wide variety of inbuilt templates. It can be accessed easily and understood by beginners.
- You can sync the documents from various platforms, and just because it is web-based, the user can access the presentations by tablets, android, IOS, or Mac devices as long as the device connected to the internet.
- Online commenting, chatting, and editing features can be accessed with Gsuite. It allows multiple formats of the conversion of slides, making the sharing process easy.
- There is no need for the installation of software to create presentations as it only requires a browser.

You can choose your G Suite edition for free for 14 days. They have three plans, such as Basic—\$4.20*, Business—\$9.6*, and enterprise—\$25.

4.2.3 Microsoft Power Point :

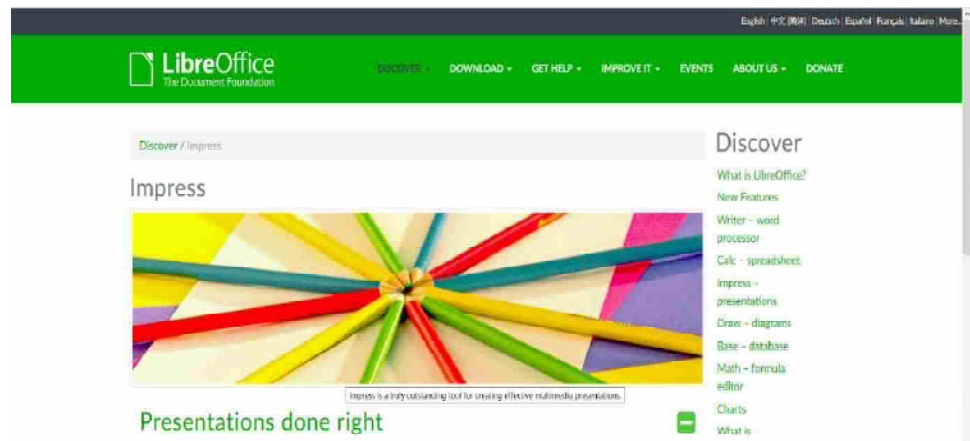


Microsoft PowerPoint is one of the popular presentation software among the user. It is coming with the Microsoft office 365 package. It is available for – ios, android, mac and windows platform. For the home user, it is coming with a one-year subscription and for the business, a user coming with monthly plans. Web-based access to PowerPoint is also available. You can try both the home and business edition for one month.

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- You can access online and offline also. To access online, you should subscribe to it or try it. To use offline, you should install the PowerPoint app on your device.
- You will get for six persons
- The user will get 6TB of cloud storage, 1TB for each user.
- It works across multiple platforms and devices at the same time.
- The user has got lots of offline and online templates, which make your presentation to the next level.
- Microsoft has a wide range of plans, choose the best plan as for your requirement.
- The user allows inserting 3D objects and animations into PowerPoint from your local drive or online library.
- The vast features like voice, touch and ink make your presentation perfect like a pro.
- Help the user to know where you are in the editing process. The user comes to know the recent changes made by others by using the feature like track recent changes.

4.2.4 Impress :



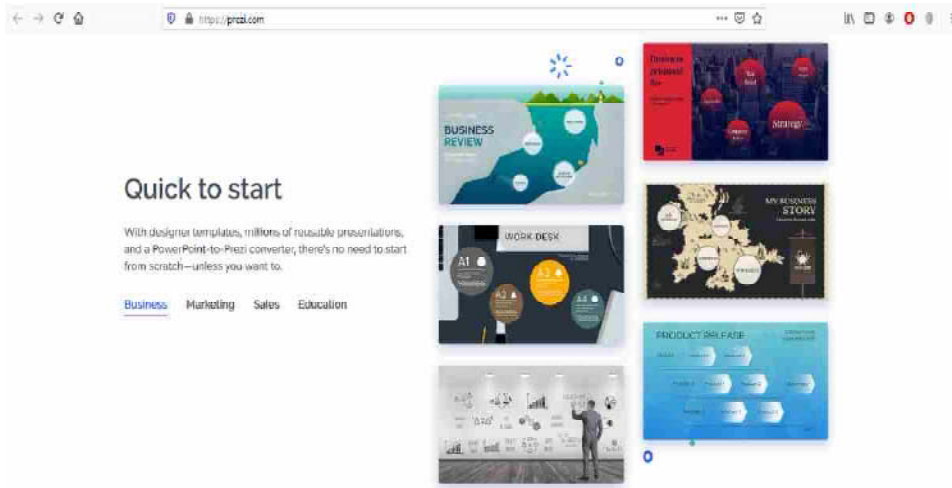
Impress is a part of LibreOffice. It's available free to everyone with all the feature. The interface looks like Microsoft PowerPoint.

- It has three modes, such as Normal (for general editing), Outline (for organising and outlining your text content), Notes (for viewing and editing the notes attached to a slide).
- The Fontworks tool allows you to create 2D and 3D images from the text.
- To speed up the process, the user can use select templates from a wide variety.

The drawing and diagramming tools help the user customised style and sophistication to your presentation.

4.2.5 Prezi :

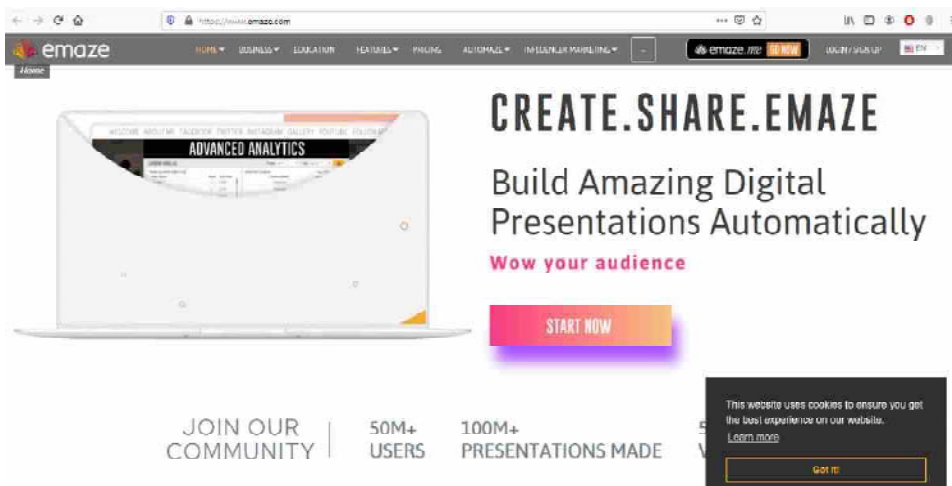
Presentation Program



Prezi.com is another remarkable online presentation program that has become famous within a few years. You can choose your Prezi for free for 14 days. They offer four types of packages for their customers : Basic, Individual, Students & Educators, and Business. They have three plans under Individual such as Standard– \$5/mo, Plus–\$15/mo, and Premium–\$59.

- The "Prezi" offer allows for the creation of valuable, attractive, and convincing multimedia content.
- It holds a wide variety of templates that can help you to create powerful presentations with easy guidelines.
- Time to time It organises the training and webinars for the user, which can help in enhancing presentations.
- Almost all file types are supported on Prezi.com. It allows uploading of every kind of media that needs to be used in presentations without any hassle.
- Prezi supports multiple device's access to the content online such as mobile and tablet.
- Quick to start to allow the user to select a ready-made template for Business, Marketing, Sales, and Education.
- Prezi Business design for small scale businesses and large-scale corporations. Prezi has an outstanding message picture that has been designed for the target audience.

4.2.6 Emaze :

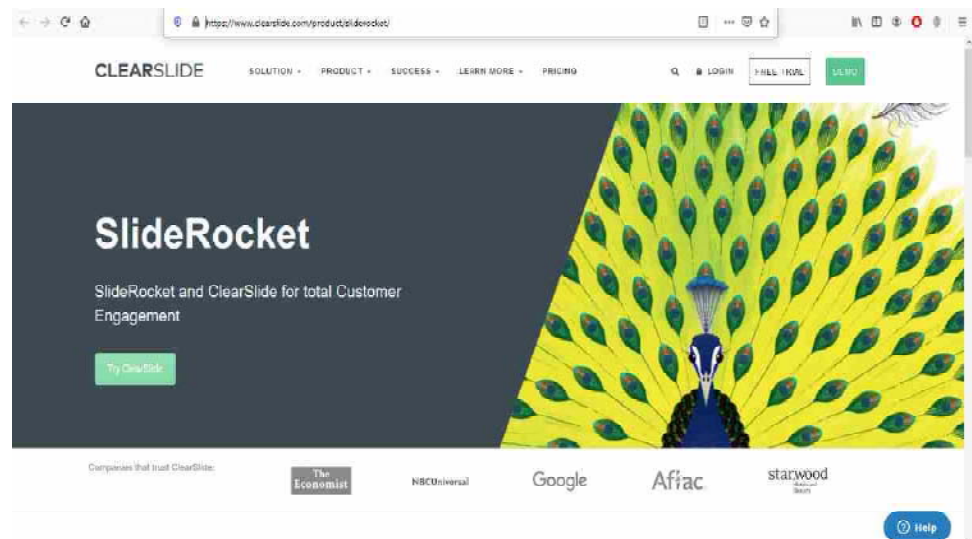


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Emaze is an online platform that provides features for presentations, Websites, E-cards, Blogs, and Photo Albums. Online access to emaze.com with login authentication allows the user to use devices like Android, IOS, Mac, or Windows. They offer three types of plans for their customers : Premium, Edu, and Team. They also offer a free trial, which includes Create & Share content –5 Projects, Audience Insight Analytics – 1 Month, and Import PowerPoint–1.

- Emaze automatically saves the work online in cloud storage. Hence, there is no need to keep work on a local drive or device manually.
- It provides slides and templates designed by the designers to fit the presentation's content correctly.
- It is easy to use, and an automatic design feature helps the user to make a stunning presentation within minutes by just uploading existing PowerPoint directly into Emaze.
- Emaze supports several languages. The automatic translation feature allows the user to translate the presentations to another language.

4.2.7 SlideRocket :



SlideRocket is a part of ClearSlide, one of the leading Sales Engagement Platform for the customer. Not only focusing on presentation, but also it is a complete System of Engagement for Sales, Marketing, and Customer Support. They offer three types of plans for their customers : Pro – \$35/mo, Group – \$65/mo, Enterprise – per user billed annually. The free trial also available.

- SlideRocket provides its users with full access to the ClearSlide content management library.
- It provides its users with the ability to import the old presentation content.
- The unique feature of app syncs content for on- or offline access to approved content for online or in-person presentations.
- You can access the content library or presentations, even when offline.
- Distinguish features like bookmarked content and search using tags makes this software unique.
- Integrated communications help every customer participate by online, email, mobile, screen share, and in-person communications made easy.
- It allows the user to secure collaboration and sharing among colleagues and clients.

- It is available with many design templates and layouts, which allow presentations to be developed according to requirements with comparatively less effort.

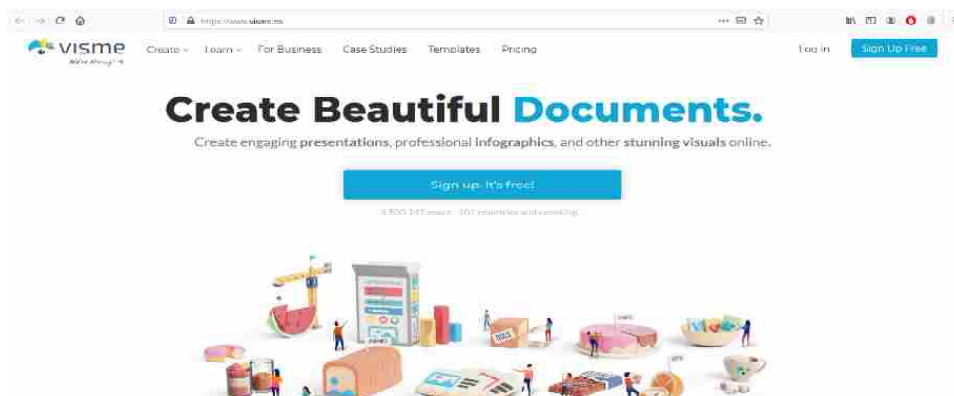
4.2.8 Haiku Deck :



This software is the best for adding life to your innovative idea and thought. Haiku Deck is a quicker way of creating an amazing presentation on android, iOS and Windows. They offer two types of plans for their customers : Pro and Premium.

- It improves your presentations and makes them far better with features like stylish fonts and pictures, layouts and filters, etc.
- Password encryption increases security and privacy services. Password encryption used to store the slides in the server.
- Presentations are saved in the cloud so that it is accessible from multiple devices and any part of the world.
- Classroom makes it easy with a classroom management dashboard, course galleries for reviewing presentations, sharing with Learning Management System (LMS), and optional addon for Google Classroom.

4.2.9 Visme :



Visme is one of the powerful content creation tools for individuals and company. It helps the user to compel the content with infographics, documents, videos and graphics, etc. It allows you to create amazing slides. It is used by so many people across the world in more than 50 countries.

- You can share the content of that website with a particular URL or on social media.

4.3.1.1 Dust :

Dust is everywhere and enters the system through the tiny holes and settled in the motherboard. The fine powder sticks to the internal parts like the circuit boards, causing short circuit. For that, it is always suggested to use the computer in a closed room with air condition. Every six months or a year, remove the dust from the computer by using the blower or vacuum machine. When you blow the dust off, make sure you are not just blowing it back into the computer. Another effective method of cleaning is to use a dust-free cloth wetted with chemical available in the market. Don't use this cloth on the motherboard.

4.3.1.2 Magnetism :

The impact of powerful magnets can cause permanent loss of data on hard disks. Electric motors or electromagnets produce magnetism. There are magnets in lots of devices we are using like the speaker, headphone and phones, etc. It is always suggested to keep away anything from your computer, which has got a magnet or creates a magnetic field.

4.3.1.3 Water and Corrosive Agents :

As every one of us knows liquid is a great enemy of most of the metal can be very dangerous to the computer's health. Most of the case the liquid enters the system by the user only, such as spills, leaks and flooding. However, leaks and flooding are not always preventable. The sweat from our skin also responsible for the corrosion of computer components. Carbonated liquids contain carbonic acids and coffee, or tea contains tannic acids, which both lead to corrosion. Cleaning liquid agent also includes elements that can cause corrosion. It is best to be cautious when using any sprays or liquids around computers.

4.3.2 Software Preventive Maintenance :

There is also software available in the market, which can be used for preventive maintenance for software corruption.

4.3.2.1 Anti-virus Applications :

It does not allow any virus to infect your system. Tones of antivirus software are available in the market. Few examples are Bitdefender, McAfee, Norton, Intego, BullGuard, Kaspersky, Panda and ESET, etc. When you run Antivirus, it will detect a computer virus which is badly damaging your computer program. You can classify the virus on the base of the nature of infection and behaviour. The most common types of viruses are worms, a trojan horse and a bomb. The worms is a program that replicates itself. The trojan horse is a program hidden inside another that may erase valuable information. The bomb is a program that embeds code in your operating system and based a specific time, causes your computer not to function at all.

The other classification is based on the location of the virus. Those are the parasitic viruses (begins in an executable file) and the boot sector viruses (resides in the hard drive).

4.3.2.2 Suggestions to Keep Infections Away :

Do not visit or download pirated software, shareware, and freeware, especially games. Always update the anti-virus database. Always use real time protection. Some advanced Anti-virus are set to check the running applications

Computer Reservation System

continuously. Always scan the external storage device. Do not visit unwanted websites or fake websites.

4.3.2.3 Defragmentation Software :

Most of the defragmentation software provided by the Operating system only. As the user started using the computer to create the files or copied some content from other source got written to the hard disk, they may become fragmented or broken, which slows down computer speed after a certain period. With the help of this software the user can unite these fragmented files and readjusts the information addresses into a continuous block. In the Microsoft operating system PC, use DEFRAG from the run command. With Macintosh, refer to your system disks for a repair program.

4.3.2.4 Testing Utility Programs :

These include a variety of software programs to scan and detect hardware and software components for information and faults. PC's come with their built-in check and scan systems. CHKDSK and SCANDISK report allocations of disk space. One of the most popular PC and Mac programs is Norton's Disk Doctor.

4.3.2.5 Cleaning Tips and Techniques :

Once programme uninstalled by the user, a few leftover files is still there in your computer required cleaning by taking the help of third-party software like CCleaner, clean master and TuneUp Utilities, etc. In addition, for cleaning process further attention should also be given to specific computer components, such as the keyboard, mouse, monitor, case, floppy disk drive, hard disk drive, and memory.

4.3.2.6 Internet Preventive Maintenance :

The distribution of the internet always plays a significant role in safety and security. If you want to share the internet among the user should install the firewall. A firewall is a combination of hardware and software. It always subscribed to the services of the firewall to protect the user from the latest threat. It also protects the user from fishing websites and spam. It allows various control to the administrator, such as user name, password, time duration, internet speed, and the list of websites or different websites coming under the specific categories that can be blocked. Few examples of firewalls are Cyberoam and FortiGate.

- Do not connect your device to the public network.
- Do not access the websites, which do not have a secure socket layer (https).
- Do not click on any link from an unknown sender.
- Do not download things from pirated websites and install them.
- Do not share your user name and password with others.

❑ Check Your Progress – 2 :

1. Most computers are built to work in a temperature range of _____ degrees F.
(a) 65–70 (b) 60–85 (c) 70–90 (d) 90–110
2. _____ unites these fragmented files and readjusts the information addresses into a continuous block.
(a) CHKDSK (b) SCANDISK (c) DEFRAG (d) CCleaner

3. Among these, _____ is used to distribute the internet with safety and security.
(a) CCleaner (b) Anti-virus (c) LAN (d) Firewall
4. Among these, we should not keep _____ nearer to the computer.
(a) Keyboard (b) Mouse (c) Mobile (d) Webcam

4.4 LET US SUM UP :

By understanding the needs, the user should select the presentation software as for the requirement. To make your presentation available anytime or anywhere, you should use the online platform. For better performance, the software should meet the recommended hardware.

4.5 ANSWERS FOR CHECK YOUR PROGRESS :

Check Your Progress 1 :

1. PowerPoint
2. Presentation programme
3. Google
4. Cloud storage
5. SlideRocket
6. PowerPoint

Check Your Progress 2 :

1. 60–85
2. DEFRAG
3. Firewall
4. Mobile

4.6 GLOSSARY :

3D – Three Dimensional (3D) is anything that has three dimensions – meaning : width, length, and depth.

1 TB = 1024 MB

2D – Stands for 2–dimensional. A 2D shape is any shape that has two dimensions.

LMS – Learning Management System

URL – Uniform Resource Locator

Preventive maintenance – Preventive maintenance refers to regular, routine maintenance to help keep equipment up and running.

SPS – Standby Power Supplies

UPS – Uninterruptible Power Supplies

4.7 ASSIGNMENT :

Make a presentation by using the zoom tool in Microsoft PowerPoint.

4.8 ACTIVITY :

You should use all these above presentations software to make a beautiful presentation to impress anyone and find the best suitable presentation software for you.

4.9 CASE STUDY :

Mr. Smith is working in a leading food manufacturing company as the head of the sales manager. He is going to negotiate with the client on the day after tomorrow. He has called the meeting for the sales teams to take the input for the points that need to concern. The sales team have prepared the presentation, but the management is not happy with the display. The administration suggests making an interactive presentation to impress the client.

If you are in that place instead of Mr. Smith, what would you do to make the display live, you also know that you have less time.

4.10 FURTHER READING :

https://gsuite.google.com/intl/en_id/products/slides/

<https://prezi.com/>

<https://www.emaze.com/>

<https://www.clearslide.com/product/sliderocket/>

<https://www.canva.com/create/presentations/>

<https://www.visme.co/>

<https://www.haikudeck.com/>

<https://www.microsoft.com/en-us/microsoft-365/powerpoint>

Computer Fundamentals by Pradeep K. Sinha & Priti Sinha

PowerPoint 2019 For Dummies by Doug Lowe

BLOCK SUMMARY :

Presentation Program

From this block, the students got the information and understand various aspect of the computer, which drastically help the students in performance. After understanding various component and its function, it is easy for the user to select the computer which is best suitable for the need. The students also able to identify the software which can fulfil the need of the students in the best suitable manner. The students learn new things from the illustration and can apply in day to day operation.

BLOCK ASSIGNMENT :

☐ **Short Answer Questions :**

1. What is the Operating System ?
2. What is Hardware ?
3. What is the CPU ?
4. What is RAM ?
5. What is ROM ?
6. What is a Graphics card ?
7. What is USB ?
8. What is Mouse ?
9. What is a keyboard ?
10. What is the hard drive and SSD ?
11. What is the word processor ?
12. What is the spreadsheet ?
13. What is a presentation programme or software ?
14. What is Preventive maintenance ?
15. What is Hardware preventive maintenance ?
16. What is Software preventive maintenance ?

☐ **Long Answer Questions :**

1. Explain the factors responsible for selecting the computer for Graphics design.
2. Which computer do you prefer for the student's basic work ?
3. What are the factors you need to consider for selecting the Operating system ?
4. Briefly discuss on preventive maintenance.
5. Explain the spreadsheet programme along with any ten features of it.
6. Explain word processor along with any ten features of it.
7. Which presentation software you like and why ? Explain in detail.

COMPUTER RESERVATION SYSTEM



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ISBN 978-81-949223-5-3

Edition : 2020

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The content is developed by taking reference of online and print publications that are mentioned in Bibliography. The content developed represents the breadth of research excellence in this multidisciplinary academic field. Some of the information, illustrations and examples are taken “as is” and as available in the references mentioned in Bibliography for academic purpose and better understanding by learner.’

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!

COMPUTER RESERVATION SYSTEM

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BLOCK 2 : WORLD GEOGRAPHY

Unit 1 World Division

Introduction, The Continents of The World and Brief History, The Seven Continents of The World, Asia, Africa, North America, South America, Europe, Australia, Antarctica

Unit 2 Itinerary Planning Location

Introduction, Airport Codes, Airline Codes or Designators, IATA Designators, ICAO Airline Codes or Designators, Accounting Code or Prefix Code, Reference List of IATA, ICAO and Prefix Codes of Airlines Across The Globe

Unit 3 Direction of Travel

Introduction, Traffic Conference Area 1 (TC 1), Traffic Conference Area 2 (TC 2), Traffic Conference Area 3 (TC 3), Global Indicators, Western Hemisphere, Eastern Hemisphere, Pacific, Pacific North, Atlantic Pacific, Atlantic, South Atlantic, Far East, Russia



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Computer Reservation System

BLOCK 2 : WORLD GEOGRAPHY

UNIT 1 WORLD DIVISION

UNIT 2 ITINERARY PLANNING LOCATION

UNIT 3 DIRECTION OF TRAVEL

WORLD GEOGRAPHY

Block Introduction :

Geography is called the "world discipline", a bridge between the human and the physical sciences. The systematic study of world geography especially the physical, cultural and the social aspects are the key drivers to promote tourism destinations across the globe. Geography is fundamental to the study of travel because travel itself is geographical in nature. Air Travel as a part of tourism involves travel between different destinations across the globe. It is imperative for you as a student of Air Travel Management to know different countries, cities and explore places of new tourism interest and sustainable growth of tourism across the globe. The block starts with an insight into the various continents of the globe with basic relevant facts about each continent. You have the scope to further explore each continent in vivid detail and note down different countries in each continent and the scope of tourism at different places. The block further acquaints you with the basic fundamentals of itinerary and planning an itinerary. As an expert, you would often have to design or plan itineraries for your customers. To plan itineraries, knowledge about Airports, Airport codes, Designators, different airlines and how they operate through various guidelines are important. The block is designed to explain the aspects related to itinerary planning in a simple way for better understanding.

The travel itineraries divide the globe into Traffic Conference Areas which are key to planning of itineraries from one country to another. The Traffic Conference Areas are clearly demarcated for easy fare calculation of air travel in any itinerary. As a student it is very important for you to know the Traffic Conference Areas, as the same would lead to correct calculation of airfare for any travel. Apart from Traffic Conference Areas, airline travel also uses two letter codes in fare construction, for travel in particular zones within the Traffic Conference Areas. These are known as Global Indicators. Global Indicators give an accurate figure for calculating the fare for travel by an airline. Any airline may take various routes for reaching a particular destination from the source of origin. Global Indicators determine these routes and helps in calculating the distances which are very important in fare construction. The block is very important for students as you all would be understanding the base upon which itinerary planning and fare construction is undertaken further.

Block Objectives :

- To define the meaning and importance of Continents.
- To list and understand the location and aspects of Seven Continents of the world.
- To list and enumerate the IATA codes for different airports across the world.
- To list and understand IATA and ICAO designators for different airlines across the globe.
- To list and identify the Traffic Conference Areas as specified for preparation of an itinerary.
- To list, identify and understand the Global Indicators (GI) of travel as a part of itinerary preparation.
- Understand the use of Global indicators for airline fare calculation and ticketing.

Block Structure :

Unit 1 : World Division

Unit 2 : Itinerary Planning Location

Unit 3 : Direction of Travel

UNIT STRUCTURE

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 The Continents of The World and Brief History
- 1.3 The Seven Continents of The World
 - 1.3.1 Asia
 - 1.3.2 Africa
 - 1.3.3 North America
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- 1.4 Let Us Sum Up
- 1.5 Answers For Check Your Progress
- 1.6 Glossary
- 1.7 Assignment
- 1.8 Activities
- 1.9 Case Study
- 1.10 Further Reading

1.0 LEARNING OBJECTIVES :

- Defining and creating awareness on the history and origin of the continents.
- To identify different continents of the Earth
- To understand and have a brief awareness about the location of each continent of the Earth.

1.1 INTRODUCTION :

The knowledge of World Geography is important for students of the Travel and Tourism Industry. The insight and knowledge of World Geography helps you in aspects related to

- (a) Preparation of itineraries
- (b) Reservation and Bookings
- (c) Fare Calculations
- (d) Assisting tourists who want to travel
- (e) Ticketing purpose.

The very basic element in World Geography is to know our Earth. The complete land area of the Earth is made of the Seven Continents. Many of the

Continents are joined while some are not. All Continents have different number of countries. You will be surprised to know that billions of years ago the landmass of the Earth was joined together and it was called PANGAEA or a Super Continent in the Palaeozoic and the Mesozoic era around 335 million years ago. Plate Tectonics, a scientific theory led to the separation of these land mass and Continental drifts gradually led to the Continents getting separated, as they are today.

1.2 THE CONTINENTS OF THE WORLD :

❖ Origin of the Word and Definition :

The word Continent is derived from the Latin word "Terra continens" meaning land and the present participle of the verb "contineo" where con (meaning together) and teneo (meaning to hold). The meaning that is deciphered is land held together or connected land. The term Continent originally was applied to any area of land with any size not separated by water. Today it is said that Continents are large continuous masses of land that are distinct and may or may not be ideally separated by water. There is no required minimum size to qualify the expanse of any continent.

❖ History of origin of Continents :

The historical references were made to continents or mainland's of places like Kent , Ireland and Wales during 1600's and of Sumatra as a continent in 1745. Peter Heylin's reference in his work, "Cosmographie" in the 1600's, says that, "A Continent is a great quantity of land, not separated by any sea from the rest of the World, as the whole continent of Europe, Asia and Africa". Ephraim Chambers in 1727, referred in the Cyclopaedia, "The world is ordinarily divided into two grand continents; the old and the new". In the Atlas designed by Emmanuel Brown in 1752, continent was defined as "a large space of dry land comprehending many countries all joined together, without any separation of water. Thus Europe, Asia and Africa are one great continent as America is another". The geographers started considered to regard North and South America as two parts of the world, making five parts in total from the late 1800s. The four continent theories prevailed though in the 19th century. The Continent of Australia was discovered in 1606 by the Europeans, but it was considered as a part of Asia for a long time. It was until the late 18th century that many geographers considered it as a continent making it the sixth continent. Samuel Butler referred of Australia as "New Holland" in 1813 and wrote of it as an "immense island, which some geographers dignify with the appellation of another continent". Antarctica was sighted in 1820 and was described as a continent by Charles Wilkes. The first Atlas that indicated Antarctica as a continent was published in 1849, but until after World War II, Antarctica was not published as a Continent in majority of the Atlas across the globe.

The Atlas published in United States during the mid 19th Century considered North and South America as distinct and separate continents, whereas Atlas printed in Europe considered them to be a single continent. It was not until the World War II that North and South America was treated as two separate continents. The Olympic flag designed in 1913, has five rings representing the five inhabited and participating continents with America being considered as a single continent and Antarctica not being included in the ring as it is uninhabited.

From 1950's most United States geographers divided America in two continents in reference to their study of geology and plate tectonics. The addition of Antarctica has led to the seven continent models. The division of America into two continents never appealed to Latin America as it was a single land mass and still the concept of six continent theories persists there. In recent years there has been questions raised by geographers to consider Europe and Asia into one single continent called "Eurasia". Most of the seven continents are recognized more by convention rather than by any strict criteria.

❑ **Check Your Progress – 1 :**

1. The Atlas published in Europe
 - (a) Considered North and South America as separate continents
 - (b) Considered North and South America as one continent
 - (c) Did not consider them as continents
2. A lot of geographers considered Europe and Asia to be one continent known as
 - (a) Euralasia (b) Euroasia (c) Eurasia
3. The word continent is derived from the Latin word
 - (a) Terra continers (b) Terra containers
 - (c) Terra continent
4. Samuel Butler referred Australia as
 - (a) New land (b) New Foundland (c) New Holland

1.3 THE SEVEN CONTINENTS OF THE WORLD :

1.3.1 Asia :

The Continent of Asia is the largest and the most populous. It has a land area of 30 percent of Earth. The Continent is the birthplace to a lot of civilizations of the world. Asia covers an area of 4,45,79,000 sq km. The Continent comprises of 48 Countries. Russia, the world's largest country is part of Asia. China and India the countries with the highest population on Earth are also part of Asia.

1.3.2 Africa :

The Continent of Africa is second largest and the second most in terms of population on earth. Africa covers an area of 30.3 million sq km including all the adjacent islands. The continent covers six percent of earth's surface area and about Twenty percent of the land area. Africa has 54 countries within the continent. The imaginary line Equator, dividing the earth into Northern and Southern hemisphere, passes through Africa. The continent experiences different climate areas. Africa also has the largest river; The Nile and the largest desert Sahara.

1.3.3 North America :

North America is a continent located on the Western and Northern part of Earth. With a a land area of 24.8 million sq km, the continent comprises 23 countries. There are 5 time zones in the entire continent and has the presence of all types of climate. On the North it is bordered with the Arctic ocean, East by the North Atlantic ocean, South East by the Caribbean sea and on the South and

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West by the Pacific ocean. The population density is 22.9 per sq km. The continent encompasses the third largest river of the world, the Mississippi.

1.3.4 South America :

South America is situated entirely in the Western hemisphere and mostly in the Southern hemisphere. The continent has a land area of 17.9 million sq km and comprises of 12 countries. The world's largest river which is 6440 km long is located in South America. South America also has the world's largest number of volcanoes.

1.3.5 Europe :

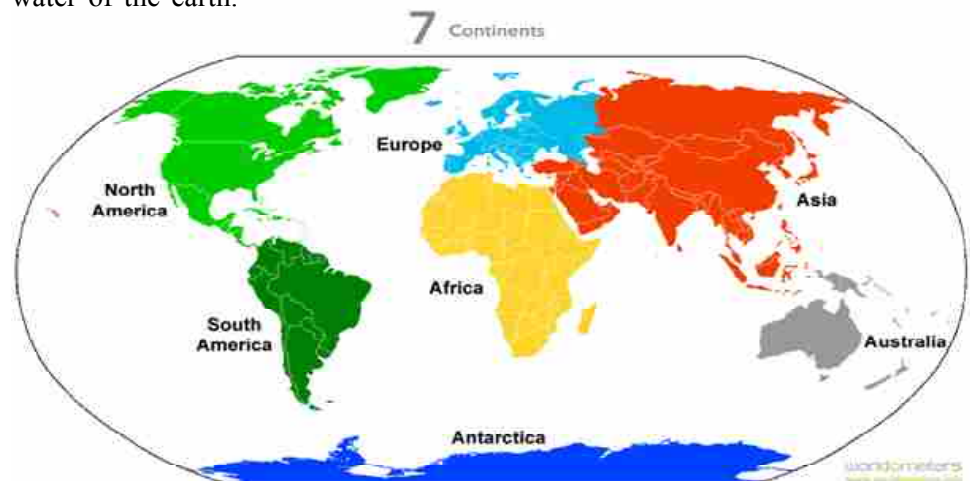
The continent of Europe is one of the oldest continents of Earth. With an area of 10.2 million Sq km, it is ranked as the second smallest continent on earth. Europe has 50 countries within the continent. Europe and Asia are part of the same land mass in Europe, separated by the Ural Mountains and the Caspian Sea. The network of sea is on all the three sides of Europe. The world's smallest country Vatican City is located in Europe. Europe boasts of the largest railway network known as the Trans Siberian Railway.

1.3.6 Australia :

Australia the Island Continent with Sea on all three sides is also referred to as the Earth's largest island or the smallest continent. The continent has a land area of 8.6 million sq km and comprises of 3 countries. The continent is located in the Southern hemisphere of the Earth and is 3700 km from North to South and about 4000 km from East to West. The continent is often called Oceania that includes land masses of New Zealand, Tasmania, Papua New Guinea, Melanesia, Micronesia and Polynesia on the Pacific Ocean. Australia has the largest coral reef, the Great Barrier Reef which is 2000 km long.

1.3.7 Antarctica :

Antarctica is the Earth's Southern most continents in the Southern hemisphere, overlaying the South Pole. Before 1840 the Continent was called Terra Australis Incognita, meaning "Unknown Southern Land". It has an area of 14 million sq km and there are no countries in Antarctica. The continent is frozen and is the coldest, emptiest and the windiest part of the world. The interior of the continent is technically the world's biggest desert and there is no permanent human inhabitation on the continent. Only plants and animals that have adapted to the cold can survive there. The continent has 75% of ice and 70 % of fresh water of the earth.



❑ **Check Your Progress – 2 :**

1. The largest and the most populous continent on Earth is
(a) Asia (b) Africa (c) Europe (d) North America
2. The Island Continent located on the Southern Hemisphere is
(a) South America (b) Australia
(c) Asia (d) Antarctica
3. The continent in the Southern Hemisphere and on the Western side of the globe is
(a) Asia (b) Africa
(c) South America (d) North America
4. The World's smallest country Vatican City is located in
(a) Africa (b) North America
(c) South America (d) Europe

1.4 LET US SUM UP :

The very basic element in World Geography is to know our Earth. The total landmass of Earth comprises of Seven Continents. Some of the Continents are joined while some are not. All Continents have different number of countries. Today Continents are understood to be large continuous distinct masses of land ideally but not necessarily separated by water. The Seven continents discussed in the unit are Asia, Africa, North America, South America, Europe, Australia and Antarctica. You need to know the continents and the countries of the world to prepare itineraries for ticketing and promoting tourism globally.

1.5 ANSWERS FOR CHECK YOUR PROGRESS :

❑ **Check Your Progress 1 :**

1. Considered North and South America as one continent
2. Eurasia
3. Terra continers
4. New Holland

❑ **Check Your Progress 2 :**

1. Asia
2. Australia
3. South America
4. Europe

1.6 GLOSSARY :

PANAGEA : Landmass of Earth joined together, billions of years ago. Also called Super Continent.

Plate Tectonics : Scientific theory that led to the separation of land mass.

Continental Drift : The separation of continents.

Eurasia : Geographers considering Europe and Asia to be one continent by the name.

Great Barrier Reef : The largest coral reef in Australia.

1.7 ASSIGNMENT :

From the map of the world, identify the Continent to which the following countries belong

- | | |
|---------------------|-----------------|
| a. Albania | b. Saudi Arabia |
| c. Mexico | d. Indonesia |
| e. Papua New Guinea | f. Canada |
| g. Belgium | h. Croatia |
| i. North Korea | j. Botswana |

1.8 ACTIVITIES :

Take a globe and indicate the different continents on a globe.

Write the names of the major oceans on Earth spread across the globe.

Indicate the oceans with the corresponding continents.

1.9 CASE STUDY :

Mr. Raman is a businessman and travels across the globe for business purpose. On a particular business trip, Mr. Raman started his journey from New Delhi in India. He had a two day business meet in Brussels in Belgium and from there he proceeded to New York in United States of America. At New York he received a call for a new business proposal at Lagos in Nigeria. Mr. Raman decided to close the deal and travelled to Lagos in Nigeria. The flight that he took made a stopover at Rio de Janeiro in Brazil and he had to take a connecting flight from there for Lagos. His business deal at Lagos was fruitful and he returned back to New Delhi in India.

- How Many Continents did Mr. Raman travel during his business trip ?
- Indicate the countries that Mr. Raman travelled on a map ?
- List five famous cities of United States of America ?
- List the countries that border Belgium ?

1.10 FURTHER READING :

"Distribution of Land and Water on Planet." UN Atlas of the Oceans

<https://wikipedia.org>

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UNIT STRUCTURE

- 2.0 Learning Objectives
- 2.1 Introduction
- 2.2 Airport Codes
- 2.3 Airline Codes or Designators
 - 2.3.1 IATA Designators
 - 2.3.2 ICAO Airline Codes or Designators
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2.0 LEARNING OBJECTIVES :

- To define an itinerary and airline itinerary.
- To understand the components of itinerary planning for air travel.
- Identify airport codes and its importance in itinerary planning for air travel.
- Identify airline codes and its importance for planning itinerary.
- To list airline codes of the world.

2.1 INTRODUCTION :

Itinerary is a planned route or journey for a traveller. Planning an Itinerary is important as it links all journey points of a traveller from the source of start of the journey, the stoppages at various destinations and back to the point of origin. As a student of aviation and travel, you have to understand the importance of planning an itinerary as it shows the essentials of all the tour ingredients and provide essential information. A flight itinerary is the proposed route for the flight. It includes the departure airports, arrival airports, connecting airports if any, time of the flight, flight number, passenger name, confirmation number and other details. To have knowledge of flight itineraries, you should understand the exact location of the city in relation to the continent, country state, and airport in a logical sequence. The study of Computer Reservation system starts with the basic identification of airports and that are part of different cities located across different countries across the globe. The computer system works on codes or

Location Identifiers as they are called to identify airports in the preparation of an itinerary.

2.2 AIRPORT CODES :

Airport codes are Location Identifiers. They are three letter geo-codes given to different airports across the globe. The assignment of this three letter geo-codes is governed by IATA (International Air Transport Association) under resolution 763 and is governed by its office in Montreal. The International Air Transport Association or IATA is a trade world's airlines founded in 1945. It has a membership of 290 airlines in 120 countries. The basic objectives of IATA include safety of air travel, simplification of business, environment concerns and services. The IATA airport codes are used mostly on

- (a) All Tickets pertaining to Airlines
- (b) Baggage tags of Airlines
- (c) Airline Timetables
- (d) Reservation portals of computer reservation system.

The Airport Codes can be named after the Name of the City, Name of the Airport (usually in cities with multiple airports) or are named after a district. A lot of cities that have undergone a change of name use the original Airport code that was assigned earlier.

Apart from IATA airport codes there is an ICAO Airport Code or a Location identifier. The ICAO (International Civil Aviation Organization) uses four letter codes for each airport across the globe under document 7910. The ICAO was created in 1947 with the support of the United Nations. The work for information regions for air traffic control and identification of airports were undertaken. ICAO airport codes are used for

- (a) Air Traffic Control
- (b) Airline Operations
- (c) Flight Planning
- (d) Facilitating weather stations

The ICAO airport codes are distributed according to the region and country. The first letter of the ICAO code stands for the Continent in which the airport is located; the second letter of the code stands for the country or group of countries in a continent; the last two letters identify each airport. There is an exception to the rule in case of large countries; the first letter designates the country and rest of the three letters identify the airport. An example to this is USA which being a large country has a country code of K and all ICAO airport codes in USA begins with the letter K; India has a country code of V for all ICAO airport codes. The letters I,J,A and X are not currently used as identifiers for any country in the ICAO airport code. There are a lot of airports that do not have a designated ICAO code. In such cases *ZZZZ* is issued as a pseudo code. Example : Aerodromes in the Antarctic used for research purpose use a *ZZZZ* code.

Sl. No.	Airport Name	IATA Code	ICAO Code	Country/ City
1	Heathrow International Airport	LHR	EGLL	London, United Kingdom
2	Al Ain International Airport	AAN	OMAL	United Arab Emirates
3	Sardar Patel International Airport	AMD	VAAH	Ahmedabad, India
4	Chhatrapati Shivaji International Airport	MUM	VABB	Mumbai, India
5	Kempegowda International Airport	BLR	VOBG	Bengaluru, India

Illustration of some Airport Codes with IATA code and ICAO code

□ Check Your Progress – 1 :

- For ICAO airport codes India has a country code of
(a) F (b) C (c) H (d) V
- Baggage Tags are designated with Airport codes of
(a) ICAO (b) IATA (c) SITA (d) No Codes
- Airports with no designated ICAO codes are designated as
(a) YYYY (b) ZZZZ (c) MMMM (d) XYXY

2.3 AIRLINE CODES OR DESIGNATORS :

Airline Codes or Designators are assigned to every airline operating around the globe for several different purposes. The codes are assigned by the International Air Transport Association (IATA) and International Civil Aviation Organization (ICAO). The purpose of both the bodies in issuing designators is different and the structure of the codes issued by both the bodies is also different. Airline Codes or designators can be classified under

- Two Character Airline Designator from IATA
- Three Character Airline Designator from ICAO
- Airline Call signs or Telephony Designators

2.3.1 IATA Designators :

IATA designates airlines with specific codes for the purpose of

- Airline reservations
- Timetable preparations
- Ticketing purpose
- Tariff
- Air way bills
- Telecommunication

The format for IATA airline designator codes are alphanumeric characters (letters or digits. (Example of the format aa(y)). The third letter is optional and has not been used though there are 3 characters assigned to airline designators. IATA has not used the optional third character in any assigned code because of

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the non compliance of some "central reservations systems". IATA has three types of designators :

- (a) Unique
- (b) Numeric/alpha and
- (c) Controlled duplicate

A controlled duplicate is a code issued to two different airlines whose destinations do not overlap and they share the same code. The code of any airline that closes its operations automatically becomes delisted and the same can be reassigned after a period of 6 months.

2.3.2 ICAO Airline Codes or Designators :

International Civil Aviation Organization allocates unique three letter airline codes or designators and Telephony designators to all airlines. ICAO had been assigning codes to airlines since 1947. Initially ICAO used to follow a two letter system but later migrated to a three letter system and made it official since 1987. The main purpose of ICAO designators is

- (a) Air Traffic Control
- (b) Communication
- (c) Conformation and implementation of global norms by all local civil aviation authorities.

Telephony Designators are call signs that are assigned to airlines to have an effective communication between the pilot and the Air traffic control.

Airline	Call Sign
South African Airways	SPRINGBOK
British Airways	SPEEDBIRD
Air France	AIRFRANS

2.4 ACCOUNTING CODE OR PREFIX CODE :

Every airline is assigned an accounting code, or prefix code. This code consists of 3 numbers, as assigned by IATA. The code is unique among all the airlines and is used for purpose of office use and accounts of the airline.

❖ Example :

Air India the national carrier of India has an accounting code of 098 and all flight tickets issued by the airline will start with 098.

❑ Check Your Progress – 2 :

1. An accounting code of an airline designated by IATA is
 - (a) 4 digit number
 - (b) 3 digit number
 - (c) 3 digit alpha code
 - (d) No code
2. Air Traffic Control is undertaken through
 - (a) IATA designators
 - (b) SITA designators
 - (c) ICAO designators
 - (d) Alpha Codes

3. The pilot and Air Traffic Control communicate through
 - (a) ICAO designators
 - (b) Commands
 - (c) IATA designators
 - (d) Telephony designators
4. The acronym ICAO stands for
 - (a) International Civil Aviation Organization
 - (b) International Carrier Air Organization
 - (c) International Civil Air Organization
 - (d) International Civil Defence Organization
5. The acronym IATA stands for
 - (a) International Air Traffic Association
 - (b) International Air Transport Association
 - (c) International Aircraft Transport Association
 - (d) International Air Token Association

2.5 REFERENCE LIST OF IATA, ICAO AND PREFIX CODES OF AIRLINES ACROSS THE GLOBE :

Sl. No.	Airline Name	IATA Code	ICAO Code	Prefix Code	Country
1	Aegean Airlines	A3	AEE	390	Greece
2	Air Lingus	EI	EIN	053	Ireland
3	Aero Republica	P5	RPB	845	Colombia
4	Aeroflot	SU	AFL	555	Russian Federation
5	Aerolineas Argentinas	AR	ARG	044	Argentina
6	Aero Mexico	AM	AMX	139	Mexico
7	Africa World Airlines	AW	AFW	394	Ghana
8	Air Algerie	AH	DAH	124	Algeria
9	Air Arabia	G9	ABY	514	United Arab Emirates
10	Air Astana	KC	KZR	465	Kazakhstan
11	Air Baltic	BT	BTI	657	Latvia
12	Air Botswana	BT	BOP	636	Botswana
13	Air Burkina	2J	VBW	226	Burkina Faso
14	Air Cairo	SM	MSC	381	Egypt
15	Air Canada	AC	ACA	014	Canada
16	Air China	CA	CCA	999	People's Republic of China
17	Air Corsica	XK	CCM	146	France
18	Air Europa	UX	AEA	996	Spain
19	Air France	AF	AFR	057	France
20	Air India	AI	AIC	098	India

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21	Air Italy	IG	ISS	191	Italy
22	Air Koreo	JS	KOR	120	DPR Korea
23	Air Macau	NX	AMU	675	Macau, SAR, China
24	Air Madagascar	MD	MDG	258	Madagascar
25	Air Malta	KM	AMC	643	Malta
26	Air Mauritius	MK	MAU	239	Mauritius
27	Air Namibia	SW	NMB	186	Namibia
28	Air New Zealand	NZ	ANZ	086	New Zealand
29	Air Peace	P4	APK	710	Nigeria
30	Air Seychelles	HM	SEY	061	Seychelles
31	Air Tanzania	TC	ATC	197	Tanzania
32	Alaska Airlines	AS	ASA	027	USA
33	Alitalia	AZ	AZA	055	Italy
34	American Airlines	AA	AAL	001	USA
35	Asiana Airlines	OZ	AAR	988	Korea
36	Austrian	OS	AUA	257	Austria
37	Avianca Costa Rica	LR	LRC	133	Costa Rica
38	Avianca Ecuador	2K	GLG	547	Ecuador
39	Avianca Peru	TO	TPU	530	Peru
40	Bahamas Air	UP	BHS	111	Bahamas
41	Bamboo Airways	QH	BAV	926	Vietnam
42	Batik Air	ID	BTK	938	Indonesia
43	Biman Bangladesh	BG	BBC	997	Bangladesh
44	Blue Air	DB	BMS	475	Romania
45	British Airways	BA	BAW	125	United Kingdom
46	Brussels Airlines	SN	BEL	082	Belgium
47	Bulgaria Air	FB	LZB	623	Bulgaria
48	Caribbean Airlines	BW	BWA	106	Trinidad and Tobago
49	Cathay Pacific	CX	CPA	160	Hong Kong
50	Cebu Pacific	5J	CEB	203	Phillipines
51	China Express Airlines	G5	HXA	987	People's Republic of China
52	Com Air	MN	CAW	161	South Africa
53	Condor	DE	CFG	881	Germany
54	Croatia Airlines	OU	CTN	831	Croatia
55	Cubana	CU	CUB	136	Cuba

**Itinerary Planning
Location**

56	Cyprus Airways	CY	CYP	078	Cyprus
57	Delta Airlines	DL	DAL	006	USA
58	Egypt Air	MS	MSR	077	Egypt
59	Emirates	EK	UAE	176	UAE
60	Ethiopian Airlines	ET	ETH	071	Ethiopia
61	Etihad Airways	EY	ETD	607	United Arab Emirates
62	Finnair	AY	FIN	105	Finland
63	Fly Dubai	FZ	FDB	141	United Arab Emirates
64	Garuda	GA	GIA	126	Indonesia
65	Gulf Air	GF	GFA	072	Bahrain
66	Indigo	6E	IGO	312	India
67	Iran Air	IR	IRA	096	Iran
68	Japan Airlines	JL	JAL	131	Japan
69	Jazeera Airways	J9	JZR	486	Kuwait
70	Jet Blue	B6	JBU	279	USA
71	Kenya Airways	KQ	KQA	706	Kenya
72	KLM	KL	KLM	074	Netherlands
73	Korean Air	KE	KAL	180	Korea
74	Kuwait Airways	KU	KAC	229	Kuwait
75	Lufthansa	LH	DLH	220	Germany
76	Malaysia Airlines	MH	MAS	232	Malaysia
77	Myanmar International Airlines	8M	MMA	599	Myanmar
78	Oman Air	WY	OMA	910	Oman
79	Pegasus Airlines	PC	PGT	624	Turkey
80	Pakistan International Airlines	PK	PIA	214	Pakistan
81	Qantas	QF	QFA	081	Australia
82	Qatar Airways	QR	QTR	157	Qatar
83	Royal Jordanian	RJ	RJA	512	Jordan
84	SAS	SK	SAS	117	Sweden
85	Saudi Arabian Airlines	SV	SVA	065	Saudi Arabia
86	Silk Air	SQ	SIA	065	Singapore
87	Spice Jet	SG	SEJ	775	India
88	Srilankan Airlines	UL	ALK	603	Sri Lanka

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89	Swiss	LX	SWR	724	Switzerland
90	Thai Airway International	TG	THA	217	Thailand
91	United Airlines	UA	UAL	016	USA
93	Virgin Atlantic	VA	VOZ	795	United Kingdom
94	Vistara	UK	VIT	228	India
95	Vietnam Airlines	VN	HVN	738	Vietnam

2.6 LET US SUM UP :

As a student of aviation and travel, you have to understand the importance of planning an itinerary. The planned route or journey for a traveller that is planned by aviation experts is of prime consideration for a traveller. Planning an Itinerary is important as it links all journey points of a traveller from the source of start of the journey, the stoppages at various destinations and back to the point of origin. To understand an itinerary you should be acquainted to airport codes, bodies like IATA and ICAO, different airlines and their codes, their country of origin and operation. The internet is a good source for you to look up for the aspects discussed in the unit and to have better understanding visually and in depth.

2.7 ANSWERS TO CHECK YOUR PROGRESS :

Check Your Progress 1 :

1. V
2. IATA
3. ZZZZ

Check Your Progress 2 :

1. 3 digit number
2. IATA designators
3. Telephony designators
4. International Civil Air Organization
5. International Air Transport Association

2.8 GLOSSARY :

IATA : International Air Transport Association

ICAO : International Civil Air Organization

ZZZZ : Pseudo Code used for airports not having a designated ICAO code.

IATA Designators : Unique and specific codes designated to airlines for the purpose of reservations, ticketing, tariff, telecommunication and other activities by IATA.

ICAO Designators : Unique 3 letter airline codes for the purpose of Air Traffic Control assigned by ICAO.

2.9 ASSIGNMENT :

Write the IATA airport codes for the following airports and the country to which they belong :

Name of Airport	IATA Code	Country
John F Kennedy Airport		
Heathrow International Airport		
Charles de Gaulle Airport		
Indira Gandhi International Airport		
Suvarna Bhumi Airport		

2.10 ACTIVITIES :

Download logo of various International carriers and create an e–scrapbook file for reference.

Arrange the carrier name and logo country wise.

Include major airports of the country in the e–scrapbook.

2.11 CASE STUDY :

Mr. Chaudhury was travelling from AMD to CCU, by AI XXX. The ticket mentioned the departure of the flight from Terminal 1. He was stuck up in traffic and told the taxi driver to take him to the domestic terminal. He somehow managed to reach the domestic terminal building which actually was terminal 2 just 45 minutes prior to the departure. As he showed his ID and ticket at the terminal, he was denied entry. The security personnel directed him to go to Terminal 1 from where his flight was. Mr. Chaudhury was perplexed and he read his ticket carefully and found that his flight was from Terminal 1 which is the International terminal building. The distance between the two terminal buildings were about a kilometre. Mr. Chaudhury ran towards Terminal 1 and since it was an International terminal there was a long queue of people at the entrance of the terminal. When he reached the gate and handed his ID and ticket, he was refused entry as the time stipulated for check in procedures had lapsed and the boarding for the flight was also over.

1. Which airport was Mr. Chaudhury scheduled to travel from ?
2. What was the place of destination for Mr. Chaudhury ?
3. Which Airline was Mr. Chaudhury scheduled to board ?
4. What are the standard timing norms for passengers at any airport in India for domestic and International travel ?
5. Which agency of the government manages security at Indian airports ?

2.12 FURTHER READING :

<https://www.iata.org>

<https://www.airlines–infocom.com>

<https://www.icao.in>



UNIT STRUCTURE

- 3.0 Learning Objectives**
- 3.1 Introduction**
- 3.2 Traffic Conference Area 1 (TC 1)**
- 3.3 Traffic Conference Area 2 (TC 2)**
- 3.4 Traffic Conference Area 3 (TC 3)**
- 3.5 Global Indicators**
 - 3.5.1 Western Hemisphere**
 - 3.5.2 Eastern Hemisphere**
 - 3.5.3 Pacific**
 - 3.5.4 Pacific North**
 - 3.5.5 Atlantic Pacific**
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- 3.6 Let Us Sum Up**
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3.0 LEARNING OBJECTIVES :

- To list and identify the Traffic Conference Areas as specified for preparation of an itinerary.
- To list, identify and understand the Global Indicators (GI) of travel as a part of itinerary preparation.
- Understand the use of Global indicators for airline fare calculation and ticketing.

3.1 INTRODUCTION :

In the previous Unit you have learnt about Airport and Airline codes which are integral part of creating an airline itinerary. This unit focuses on the direction in which travel has to be planned for any traveller. To understand the direction of travel, you have to understand the how the travel industry bifurcates the entire earth and the different countries into Traffic Conference Areas. The world is

divided into four parts or hemispheres; the Western, Eastern, Southern and Northern Hemisphere. The imaginary line known as the Equator horizontally divides the earth equally into the Northern and the Southern hemisphere. The Prime Meridian is a vertical imaginary line divides the Earth equally into the Western and Eastern Hemispheres. Countries on the southern part of Equator are located in the Southern Hemisphere and to the North of the Equator are located in the Northern Hemisphere. The countries located on the Eastern side of the Prime Meridian are located in the Eastern Hemisphere and Countries on the Western Side of the Prime Meridian are located in the Western Hemisphere.

The division of the Earth through these imaginary lines is not followed in air travel as there would be lot of challenges related to fare calculation. To negate this issue and to ease fare construction process the International Air Transport Association (IATA) has divided the globe into three areas also known as Traffic Conferences.

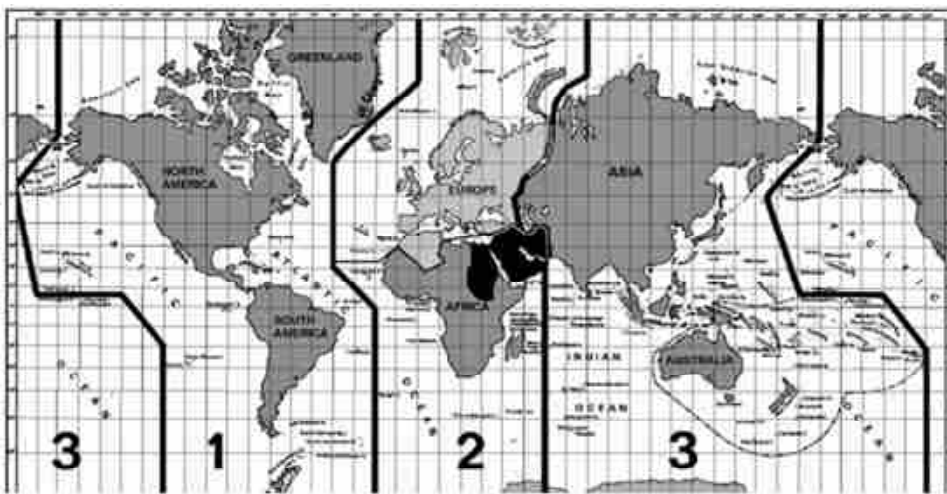


Illustration of Traffic Conference Areas as specified by IATA

3.2 TRAFFIC CONFERENCE AREA 1 (TC 1) :

The Areas under Traffic Conference 1 (TC 1) comprises of the following countries :

Continent	Region	Region
North America		Canada, Greenland, Mexico, St. Pierre & Miquelon, USA including Alaska, Hawaii, Puerto Rico and US Virgin Islands
	United States Territories	American Samoa, Johnston Atoll, Swains Is., Baker Is., Kingman Reef, Palmyra Is., Guam, Midway Is., Wake Is., Howland Is., Northern Mariana Is., Jarvis, Saipan.
	Caribbean	Anguilla, Dominican Republic, Netherlands Antilles, Antigua and Bermuda, Grenada, St. Kitts and Nevis, Barbados, Haiti, St. Vincent and The Grenadines, Cayman Islands, Jamaica, Trinidad and Tobago, Cuba, Martinique, Turks and Caicos Is., Dominica, Montserrat, British Virgin Islands
	Central America	Belize, El Salvador, Honduras, Costa Rica, Guatemala, Nicaragua.

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South America		Argentina, Ecuador, Peru, Bolivia, French Guiana, Suriname, Brazil, Guyana, Uruguay, Chile, Panama, Venezuela, Colombia, Paraguay
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3.3 TRAFFIC CONFERENCE AREA 2 (TC2) :

The Areas under Traffic Conference 2 (TC 2) comprises of the following countries :

Continent	Region	Region
Europe		Albania, Germany, Norway, Algeria, Gibraltar, Poland, Andorra, Greece, Portugal, Armenia, Hungary, Romania, Austria, Iceland, Russia (in Europe), Azerbaijan, Ireland, San Marino, Belarus, Italy, Serbia, Belgium, Latvia, Slovakia, Bosnia & Herzegovina, Liechtenstein, Slovenia, Bulgaria, Lithuania, Spain, Croatia, Luxembourg, Sweden, Cyprus, Macedonia, Switzerland, Czech Republic, Malta, Tunisia, Denmark, Moldova, Turkey, Estonia, Monaco, Ukraine, Finland, Montenegro, United Kingdom, France, Morocco, Georgia, Netherlands.
Antarctica		
Middle East		Bahrain, Jordan, Saudi Arabia, Egypt, Kuwait, Sudan, Iran, Lebanon, Syria, Iraq, Oman, United Arab Emirates, Israel, Qatar, Yemen
Africa	Central Africa	Malawi, Zambia, Zimbabwe.
	Eastern Africa	Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Tanzania, Uganda.
	South Western Africa	Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland.
	Western Africa	Angola, Benin, Burkina, Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Brazzaville, Congo Kinshasa, Côte D'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea – Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo.
	Indian Ocean Islands	Comoros, Madagascar, Mauritius, Mayotte, Reunion, Seychelles, Libya.

3.4 TRAFFIC CONFERENCE AREA 3 (TC 3) :

The areas under Traffic Conference 3 (TC 3) comprises of the following countries :

Continent	Region	Region
Asia	South Asia	Afghanistan, India, Pakistan, Bangladesh, Maldives, Sri Lanka, Bhutan, Nepal.
	South East Asia	Brunei, Darussalam, Kyrgyzstan, Palau, Cambodia, Laos, Philippines, China (excluding Hong Kong SAR and Macao SAR), Macao SAR, Russia (in Asia), Chinese Taipei (Taiwan), Malaysia, Singapore, Guam, Micronesia, Thailand, Hong Kong SAR, Mongolia, Turkmenistan, Indonesia, Myanmar, Uzbekistan, Kazakhstan, Northern Mariana Is., Viet Nam (Saipan, Rota), Japan Korea
Oceania	South West Pacific	American Samoa, Nauru, Solomon Is, Australia, New Caledonia, Tonga, Cook Islands, New Zealand, Tuvalu, Fiji, Niue, Vanuatu French Polynesia, Papua New Guinea, Wallis and Futuna Is., Kiribati, Samoa.

❑ Check Your Progress – 1 :

- Germany lies in
(a) TC 1 (b) TC2 (c) TC 3
- Canada is a part of
(a) TC1 (b) TC 2 (c) TC 3
- Imaginary Vertical line dividing the Earth equally is called
(a) Equator (b) Tropic of Cancer (c) Prime Meridian

3.5 GLOBAL INDICATORS :

You have learnt in the previous section how the world is divided into three Traffic Conference Areas by IATA for the ease of calculating Passenger Air fares which are a part of the itinerary. The Traffic Conference areas would help you to understand the direction of travel that a passenger undertakes in his itinerary. Once you have understood the Traffic Conference Areas it is very important for you to learn the Global Indicators. Global Indicators are two letter codes used in fare construction for an airline in an itinerary. It is the first step for construction of airfares and is used to determine routes, stopovers etc. Choosing an incorrect Global Indicator during fare construction may lead to choosing the wrong fare for the itinerary.

3.5.1 Western Hemisphere (WH) :

Any travel itinerary originating and ending in the Western hemisphere or Traffic Conference 1 (TC 1) will have WH as the global indicator.

Example : Travel from Washington DC in USA to Lima in Peru will have WH as the global indicator.

3.5.2 Eastern Hemisphere (EH) :

Any travel within the Eastern Hemisphere the global indicator shall be EH.

Example 1 : Kolkata in India (TC 3) to Bangkok in Thailand (TC 3)

Example 2 : Madrid in Spain (TC 2) to Bangkok in Thailand (TC 3)

Example 3 : Madrid in Spain (TC 2) to Cairo in Egypt (TC 2)

3.5.3 Pacific (PA) :

Any travel across the Pacific Ocean will have a global indicator of PA

Example 1 : Montreal in Canada (TC 1) to Jakarta in Indonesia (TC 2)

Example 2 : Mexico City in Mexico (TC1) to Cape Town in South Africa (TC 2) via Hong Kong (TC 3)

3.5.4 Pacific North (PN) :

The global indicator is similar to PA, however, the global indicator is applied whenever the travel is conducted between a region in Traffic Conference 1 (TC 1) and Traffic Conference 2 (TC 2) via North America across the Pacific Ocean. Example : Santiago in Chile (TC 1) to Auckland in New Zealand (TC 2) via Los Angeles in United States of America (TC1)

3.5.5 Atlantic Pacific (AP) :

Any travel happening between both the Atlantic Ocean and the Pacific Ocean, will have a global indicator of AP. The travel shall cross both the oceans. Example : Istanbul in Turkey (TC 2) to Tokyo in Japan (TC 3) via New York in United States of America (TC 1)

3.5.6 Atlantic (AP) :

Any travel across the Atlantic Ocean, will have a global indicator of AP.

Example 1 : New York in United State of America (TC1) to Madrid in Spain (TC 2).

Example 2 : New York in United States of America(TC1) to Sydney in Australia (TC 3) via London in United Kingdom (TC 2).

Example 3 : Rio de Janerio in Brazil (TC 1) to Seoul in South Korea (TC 3) via London in United Kingdom (TC 2).

3.5.7 South East Asia or South Atlantic (SA) :

Any travel originating from the following countries in South America abbreviated as ABCUP (Argentina, Brazil, Chile, Uruguay, Paraguay) and going to South East Asia or South Asia or Indian Ocean islands or South Africa or any direct Trans Atlantic flight will have a global indicator of SA. Example : Buenos Aries in Argentina (TC 1) to Mumbai in India (TC 3) via Cape Town in South Africa (TC 2).

In the example the flight originates from an ABCUP country and is going to Mumbai which is in South Asia. Though the flight has crossed the Atlantic but it has taken a stopover at Cape Town in South Africa.

3.5.8 Far East (FE) :

Any travel that happens between European part of Russia or Russia to the West of the Ural Mountains and Ukraine to any region in the Traffic Conference

3 (TC 3), except Japan and Korea, the global indicator for the same shall be FE.
Example : Moscow in Russia (TC 3) to Beijing in China (TC3).

In this the case the global indicator can be EH also but since the flight is originating from the European part of Russia, FE shall be the most appropriate indicator.

3.5.9 Russia (RU) :

Any travel that happens between European part of Russia or Russia to the West of the Ural mountain except for travel to Central Asian countries, Kazakhstan, Kyrgyzstan, Mongolia, Russia in Asia, Tajikistan, Turkmenistan, Uzbekistan via Japan and Korea.

Example 1 : Moscow in Russia (TC 3) to Osaka in Japan (TC 3)

Example 2 : Beijing in China (TC 3) to Moscow in Russia (TC 3) via Osaka in Japan (TC 3)

Example 3 : Beijing in China (TC 3) to Moscow in Russia (TC 3) via Seoul in Korea (TC 3)

Check Your Progress – 2 :

1. Two Letter words used in Fare Construction is
 - (a) Fare Code
 - (b) Fare Indicator
 - (c) Global Indicator
2. Travel Originating from ABCUP country to India would have a GI of
 - (a) EH
 - (b) AP
 - (c) SA
 - (d) FE
3. Any travel across Pacific Ocean shall have a GI of
 - (a) AP
 - (b) PA
 - (c) PN
 - (d) FE
4. Imaginary line horizontally dividing the Earth into halves is
 - (a) Prime meridian
 - (b) Equator
 - (c) Tropic of Cancer
 - (d) Tropic of Capricorn

3.6 LET US SUM UP :

To understand the direction of travel, you have to understand the how the travel industry bifurcates the entire earth and the different countries into Traffic Conference Areas. Geographically the world is divided into the Western, the Eastern, the Southern and the Northern Hemisphere. To undertake Itinerary planning and Fare construction you have to understand the aspects as mentioned in the unit.

3.7 ANSWERS TO CHECK YOUR PROGRESS :

Check Your Progress 1 :

1. TC 2
2. TC 1
3. Prime Meridian

❑ **Check Your Progress 2 :**

1. Global Indicator
2. SA
3. PA
4. Equator

3.8 GLOSSARY :

- TC :** Traffic Conference
GI : Global Indicator
WH : Western Hemisphere
EH : Eastern Hemisphere
PA : Pacific
PN : Pacific North
AP : Atlantic Pacific
SA : South Atlantic
FE : Far East
RU : Russia

3.9 ASSIGNMENT :

❖ **Know the Locations :**

Indicate the Traffic Conference Areas and the Continent for the following countries :

Country	Traffic Conference Area	Continent
Jamaica		
Angola		
Ahmedabad		
Puerto Rico		
Samoa		

❖ **Indicate the Global Indicators for the under mentioned itineraries :**

Itinerary	Global Indicator
California in USA to Buenos Aries in Argentina	
New Delhi in India to Colombo in Sri Lanka	
Ottawa in Canada to Wellington in New Zealand via Madrid in Spain	
Rio de Janerio in Brazil to Mauritius in Indian Ocean	
Vladivostok in Russia to Jakarta in Indonesia	

3.10 ACTIVITIES :

Indicate the 3 Traffic Conference Areas on a globe.

Mark each Global Indicator zones on a globe and see the direction of travel.

Create imaginary itineraries and see on globe how the direction of travel shall be; locate the Traffic conference areas from the source to the destination and the applicable GI.

3.11 CASE ANALYSIS :

John was on a tour across the globe. He had reached Ankara to explore the beauty of the country. His next destination was to explore the beautiful Fujiyama Mountains in Japan. His flight to Tokyo was not direct but was via Washington DC.

1. Which are the countries that John will visit from his source of journey to his destination ?
2. What are the Traffic Conference Areas of the countries of his travel ?
3. What shall be his Global Indicator for travel ?

3.12 FURTHER READING :

www.iata.org

International fare quote and rules

Travel Learning Platform; <https://talearnings.com>

Tutorials on GlobalIndicators; Amrita Haldankar; www.youtube.com

BLOCK SUMMARY :

The Units in the above block provided an insight for you about the globe in which travel happens. The continents and the countries in each continent are the basics for you to learn to know about travel and how travel can be planned. The further knowledge of countries under each continent and the travel destinations would make your understanding of the travel business better. Air travel has some basic terminologies that designate different airlines and airports. These terminologies make communication better to offer better services to the traveller. There are guiding bodies for airlines and standard procedures laid down by these bodies are followed across the globe. Identification of various codes and standard procedures laid down by IATA shall help you in forming a base for advanced level knowledge in Airline travel. In Air travel the globe is divided into various Traffic Conference Areas for ease of travel. The conventional geographical division of hemispheres do not apply to air travel and it is very important for you to understand and comprehend the Traffic Conference Areas and the direction of travel. The fare calculations are based on the direction of travel and global indicators listed are a guide to decide the direction and calculate fares. Your understanding of each global indicator will create a very strong base for calculating fares.

BLOCK ASSIGNMENT :

1. What are Traffic Conference Areas ? What are the benefits of dividing the world into different Traffic Conference Areas ?
2. List 5 Global Indicators and enumerate with relevant examples ?
3. Write briefly about the different designators used by Airlines with relevant examples ?
4. Mr. John travelled from Washington DC to Paris and then went to China for a business trip. List the continents travelled by Mr. John and write brief about those continents ?
5. What are Continents ? Enumerate the evolution of various continents on Earth ?

COMPUTER RESERVATION SYSTEM



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ISBN 978-81-949223-5-3

Edition : 2020

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The content is developed by taking reference of online and print publications that are mentioned in Bibliography. The content developed represents the breadth of research excellence in this multidisciplinary academic field. Some of the information, illustrations and examples are taken “as is” and as available in the references mentioned in Bibliography for academic purpose and better understanding by learner.’

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!

COMPUTER RESERVATION SYSTEM

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BLOCK 3 : BASIC ELEMENTS OF AIR FARE

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Introduction, Travel Class, Fare Basis Codes, Types of Airfare, Basic Terms Related to Fare Formula

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Unit 3 Ticket Stock

Introduction, Manual or Paper Tickets, Electronic Tickets, Advantages of Electronic Tickets, Passenger Name Record, Check in Procedures, Limitation of Electronic Tickets, Documents of Travel

Unit 4 Payment Procedure

Introduction, Payment Procedure and Transaction between Travel Agents and Airlines, Benefits of Billing and Settlement Plan, Modes of Payment by Passengers, Cash, Cheque, Credit Card, Debit Card, ACH Debit Card, Bank Transfers, Digital Wallets, Mobile Payments, Unified Payment Interface (UPI), Equated Monthly Instalments, Card Point Redemption, Frequent Flyer Programs, Refund Procedures, Refund for Itinerary cancellation, Refund for No Show, Refund for cancellation of flight by airline, Validity of an airline ticket



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Computer Reservation System

BLOCK 3 : BASIC ELEMENTS OF AIR FARE

UNIT 1 ELEMENTS OF AIRFARE

UNIT 2 CURRENCY CONVERSION

UNIT 3 TICKET STOCK

UNIT 4 PAYMENT PROCEDURE

BASIC ELEMENTS OF AIR FARE

Block Introduction :

The calculation of airfare requires a vivid knowledge of several elements that requires to be managed. In the previous block, you have learnt about Traffic Conference Areas, Global Indicators, and various codes that decide the direction of travel. The units gave you a perspective of how differently the globe is divided for travel purpose and what are the benefits that you as a student of airline ticketing derive. The ticketing aspect of bifurcation of our globe is different from the actual division undertaken geographically. The units in this block take you through the ways how an airline divides its cabin into various categories or class, to optimize sales and revenue. Every seat of an airline follow own set of rules, facility and pricing. Seats on an airline are the most perishable commodity and as a student of airline ticketing, you have to understand the dynamics of managing them. Price dynamics and services are key to competition in the airline industry. The block further provides an insight into the various codes used for calculation of airfare related to fare basis, passenger type, booking and other aspects. The block also enumerates basic terminologies related to airfare calculation. Airlines across the globe use a fictitious currency, the Neutral Unit of Construction, for its ease of transaction and calculations. The block details out the conversion methodologies as specified by IATA. The knowledge of different types of tickets that were in use and is in use is also an important aspect of air ticketing. A detailed study on manual and e tickets, the benefits, the trends, methods of Check in at airports and the most important the modes of payment used for purchasing an airline ticket is detailed in the block.

Block Objectives :

- To identify and understand the importance of different elements used for construction of airline fares.
- To identify and understand the airline currency system and its role in Airline ticketing.
- To identify and understand the types of tickets, ticketing systems and procedures related to air travel.
- To explain and understand the procedure of payment between travel agent and airlines, in booking a flight ticket, refund policies and procedures involved in a flight ticket for a passenger.

Block Structure :

Unit 1 : Elements of Airfare

Unit 2 : Currency Conversion

Unit 3 : Ticket Stock

Unit 4 : Payment Procedure

UNIT STRUCTURE

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 Travel Class
- 1.3 Fare Basis Codes
- 1.4 Types of Airfare
- 1.5 Basic Terms Related to Fare Formula
- 1.6 Let Us Sum Up
- 1.7 Answers to Check Your Progress
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- 1.9 Assignment
- 1.10 Activities
- 1.11 Case Study
- 1.12 Further Reading

1.0 LEARNING OBJECTIVES :

- To identify and understand the importance of different fare basis codes used for ticketing in a given itinerary.
- List and identify the types of airfare relevant to the airline industry.
- List the basic terms related to airfare construction.

1.1 INTRODUCTION :

Airfare calculation manually is a complex and cumbersome process and it requires a lot of understanding before you can actually undertake the same. You have already learnt about Airline codes, Airport codes, Traffic Conference areas and Global indicators. These are the basic steps to understand the direction of travel before constructing the fare for the actual travel. To learn further about fare construction you have to acquaint yourself to some more elements of fare construction.

1.2 TRAVEL CLASS :

Majority of the airliners of the world divide the airline cabin into different class for different set of passengers. Each class of the airline have different benefits, comfort, service and price structure attached to it. Airline companies divide every seat of an aircraft into different categories and follow their own set of rules, services, facilities and pricing. Traditionally an aircraft was divided into three classes; First, Business and Economy. With price dynamics and services being the key to competition, additional classes like a Premium Economy have been added by airline companies.

1.3 FARE BASIS CODES :

Fare Basis codes are alpha numeric codes used by airlines, present on passenger tickets, to convey information to its staff and travel agents about the rules applicable to the particular fare charged. The fare basis codes may be 3 to 7 characters long depending on the airline and contains information about the price of the ticket, how many miles the passenger can obtain by flying, flexibility of the ticket in reference to refund, modify etc. Fare Basis codes start with a letter called Booking Codes that indicates the travel class of a passenger.

Booking codes were initially defined by the International Air Traffic Association (IATA) but soon there was deviation by a lot of Airlines from the IATA standards. The booking codes have in a lot of cases become airline specific. Booking codes are identifiers used by the revenue management team of the airline to determine how many seats can be sold at a particular fare level. Yield Management is one of the key focus areas to the business of any airline, as airline seats are highly perishable commodity. Seats if left vacant or unsold for an airline leads to loss for the airline. The most probable Booking Codes used by airlines are as

Booking Code	Explanation of the Booking Code
P	Full Fare First Class Premium
F	Full Fare First Class
A	Discounted Fare First Class
J	Full Fare Business Class Premium
C, D	Full Fare Business Class
E, W	Economy Class (Full Fare Premium)
B, M, H, Y	Economy Class (Full Fare)
K, L, Q, V, U, T, X, N, O, S	Discounted Fare Economy Class

There is a combination of other letters or codes next to the Fare basis that indicates the feature of the ticket. The combinations are :

Code	Feature
E	It means that the fare sold is an EXCURSION fare. An Excursion fare has a minimum and maximum stay requirement at a destination and is usually for leisure travellers. The corresponding numbers that follow indicate the maximum stay in days or months.
H	The second letter as H after a booking code refers to HIGH SEASON fare
L	The second letter as L after a booking code refers to LOW season fare
W	The second letter as W after a booking code refers to Weekend fare.
X	If not the first letter, X denotes that the fare is valid on a Weekday

ID/AD	The letters ID/AD denotes Industry discounted fare or Travel agency staff discount
SPR/SVR	The codes are airline specific and may indicate a SUPER SAVER fare.
N	If not the first letter, N denotes that the fare refers to travel that is permitted in the night only.

Apart from the codes as mentioned above there are different passenger type codes in the fare structure and the same may vary in different airlines.

Passenger Type Code	Feature
AP/AB	Advance Purchase
BT	Bulk Inclusive tour
AN	Agent Non Refundable
BD	Budget Discounted
CD	Senior Citizen
CH	Child
EE	Excursion
GV	Group Inclusive tour
IN	Infant
IP	Instant Purchase
IS	Late Booking Fare
IT	Inclusive Tour
OW	One Way
OX	One Way Excursion
PX	Pax Fare
RT	Round Trip
RW	Round the World
SC	Ship Crew
SD	Student Fare
SS	Super Saver
SX	Superflex Fare
UU	Standby Fare
VU	Visit USA
ZZ	Youth Fare

☐ Check Your Progress – 1 :

1. The Passenger Type Code IP stands for

(a) Super Saver	(b) Instant Purchase
(c) Inclusive Tour	(d) Senior Citizen

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- 2. The second letter W after a booking code denotes
(a) High Fare (b) Low Fare (c) Child Fare (d) Weekend Fare
- 3. The Booking Code A denotes
(a) Economy Class Fare (b) First Class Fare
(c) Discounted First Class Fare
- 4. The Booking code X denotes
(a) Economy Class Fare (b) Discounted Economy Class Fare
(c) First Class Fare

1.4 TYPES OF AIRFARE :

The price paid to travel on an aircraft of a particular carrier by a passenger is called Airfare. Airfares can be either Published or Unpublished. A Published airfare is the one that can be purchased by anyone from the Airlines, Airline Booking websites, Travel agencies or other Online booking sites. These fares are published by the Airline carriers on the public domain to make passengers aware of the fare being charged by a particular carrier on specific route/destination. Unpublished airfare is also known as Private Fare, Negotiated Fare, Consolidator Fare or Wholesale Fare. These fares are not published by the airline in the public domain. Airlines often give these fares to travel agencies under a service level agreement contract and confidentiality contracts. The objective of unpublished fares by airline companies is to ensure better yield management of the seats using price dynamics and by assigning it to a third party for selling it.

There are different types of published fares having own special rules, restrictions and availability. Various structures are designed by Airline companies to ensure optimal seat sales. The different types of published fares are as :

Type of Fare	Detail
APEX Fare	This is a discounted International fare which is purchased in advance. The number of days that the purchase has to be made in advance depends on the airline. There may be other restrictions imposed by airlines on such type of fares like fees for change or Non-refundable criteria.
Discount Fare	This is a cheap fare for a limited time on both International and Domestic sectors and may have a lot of restrictions. Example of such fares includes seat sale for particular sectors of flight or a Super Wednesday sale etc. There may be other restrictions as imposed by the airlines like Travel Dates, Minimum Stay, Maximum Stay, No refund etc
Full Fare/ Unrestricted	This is the most expensive fare that the airlines publish. Refund and change are often permitted by the airlines in this type of fare. The tickets with Full fare can be purchased on the same date of travel. The price indicated by the airlines for this type of fare is a benchmark for discounted fares.

Joint Fare	When more than one airline work together as a partner under a contract to get a passenger to a particular destination
Through Fare	This type of fare means that one fare is charged to the passenger from his departure source to the destination source inspite of a stopover by the airline in a third city.
Bereavement Fare	This is usually a last minute discounted fare offered by the airlines and is often given to passengers who have to attend funerals in emergency. The facility is absolutely airline specific.
Open Jaw	This type of fare is for Return tickets where the Departure Source and the Destination source may be different each way. Open Jaw fares may be categorized as Destination Open Jaw or Origin Open Jaw. Example of Destination Open Jaw : New York to Rome and Paris To New York Example of Origin Open Jaw : New York to Rome and London to Boston
Multicity	This type of fare is for single Airline tickets with multiple stops. This type of ticket actually converts layovers to stopovers for travellers and saves a lot of money for them. A layover is waiting at a destination for a connecting flight less than 12 hours whereas a Stopover is waiting for a connecting flight a destination for more than 12 hours.

1.5 BASIC TERMS RELATED TO FARE FORMULA :

To construct an itinerary fare construction, different aspects are taken into consideration and the formula is derived. The same is applicable to all airlines; however, with modern Global Distribution Systems and Computer Reservation Systems the process is undertaken by the system.

1. **Fare Break Point (FBP) :** The destination where a given airline fares begins or ends.
2. **Global Indicator (GI) :** Global Indicators are two letter codes used in fare construction to determine the routing to which the fare applies in a given itinerary. (Detailed reference available in Block 2, unit 3)
3. **Neutral Unit of Construction (NUC) :** A NUC is a fictitious currency used by the airline Industry for fare calculation.
4. **Maximum Permitted Mileage (MPM) :** Maximum Permitted Mileage represents the maximum distance between two specified International points established on the basis of shortest combinations of non-stop sectors and where applicable, over specified construction points, increased by

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20%. The Mileage manual of IATA contains close to 7 million MPM distances and is published every year.

5. **Ticketed Point Mileage (TPM) :** The actual distance in miles, which an aircraft has flown, for a particular itinerary, between all points from its source to the destination.
6. **Extra Mileage Allowance (EMA) :** An additional mileage allowance deducted from the TPM and provided to an air ticket on a particular itineraries as specified.
7. **Higher Intermediate Point (HIP) :** A City between the city of origin and the fare break point has a higher fare than the destination 'city; the higher fare must be used.
8. **Excess Mileage Surcharge (EMS) :** An additional surcharge levied on the NUC for itineraries where the TPM is more than the MPM with no EMA. The surcharges in ticketing are decided by the Flight Ticketing manual.
9. **Rate of Exchange (ROE) :** The rates of exchange notified by IATA to convert local currency fare to NUC and to convert the NUC to the currency of the country from where the itinerary commences.
10. **Local Selling Fare (LSF) :** The currency in which the payment is done for a particular itinerary.

☐ Check Your Progress – 2 :

1. The actual distance in miles, which an aircraft has flown, for a particular itinerary is called
 - (a) Ticketing Point Mileage
 - (b) Maximum Permitted Mileage
 - (c) Extra Mileage
2. A City between the city of origin and the fare break point has a higher fare than the destination 'city is known as
 - (a) Extra Mileage Surcharge
 - (b) Higher Intermediate Point
 - (c) Surplus Point
3. When more than one airline work together as a partner under a contract to get a passenger to a particular destination, the fare charged is called
 - (a) APEX Fare
 - (b) Open Jaw
 - (c) Bereavement Fare
 - (d) Joint Fare
4. Last minute discounted fare offered by some airlines for death in someone's family is
 - (a) Joint Fare
 - (b) Bereavement Fare
 - (c) Discounted Fare
 - (d) APEX Fare
5. A passenger type code "CH" indicates
 - (a) Senior Citizen
 - (b) Infant
 - (c) Excursion
 - (d) Child
6. When departure source and destination is different each way, the fare is indicated as
 - (a) Open Jaw
 - (b) Apex
 - (c) Bereavement
 - (d) Joint

1.6 LET US SUM UP :

Any airline that issues a ticket indicates some codes that denote the Fare Basis codes. These codes are alpha numeric codes used by airlines, present on passenger tickets, to convey information to its staff and travel agents about the rules applicable to the particular fare charged. To optimize the yield of its seats and sales, airlines use a variety of fares and structures that are also denoted by codes. In the unit above you have studied about the types of fares and the codes associated to them which shall be helpful to you in construction of tickets. There are certain basic elements that need to be understood in fare construction process. The unit above lists these elements as a glossary for easy understanding for you which shall help you to build your knowledge and understanding on the ticketing process.

1.7 ANSWERS TO CHECK YOUR PROGRESS :

☐ Check Your Progress 1 :

1. Instant Purchase
2. Weekend Fare
3. Discounted First Class Fare
4. Discounted Economy Class Fare

☐ Check Your Progress 2 :

1. Ticketing Point Mileage
2. Higher Intermediate Point
3. Joint Fare
4. Bereavement Fare
5. Child
6. Open Jaw

1.8 GLOSSARY :

FBP : Fare Break Point

NUC : Neutral Unit of Construction

MPM : Maximum Permitted Mileage

TPM : Ticketed Point Mileage

HIP : Higher Intermediate Point

EMA : Extra Mileage Allowance

EMS : Extra Mileage Surcharge

ROE : Rate of Exchange

LSF : Local Selling Fare

1.9 ASSIGNMENT :

- ❖ **Indicate the interpretation of the under mentioned booking codes :**

Code	Interpretation
W	
T	
J	
F	
A	

- ❖ **Interpret the meaning of the following letters that appear next to Fare Basis codes :**

Code	Interpretation
E	
X	
ID	
N	
L	

- ❖ **Expand the following acronyms :**

Term	Expansion
NUC	
FBP	
MPM	
TPM	
GI	

- ❖ **Interpret the meaning of the under mentioned Passenger type codes :**

Code	Interpretation
EE	
IT	
CD	
OW	
RT	

1.10 ACTIVITIES :

Write definitions of the under mentioned terms :

Term	Definition
Fare Basis Codes	
Booking Codes	
Passenger Type Codes	
Discount Fare	
Open Jaw Fare	

1.11 CASE STUDY :

Mr. Sharma planned a vacation to Bali from New Delhi with his family. He searched the internet and found a great offer on an airline that was giving cheap tickets for the Economy Class. The conditions for the trip that the airline mentioned for the ticket was a minimum stay of 5 nights and 6 days at Bali. The offer was only valid for passengers who were booking 30 days in advance from the date of departure. It was still 45 days for his planned vacation and Mr. Sharma decided to avail the offer. The only condition that Mr. Sharma was a little worried was a no refund on cancellation of ticket.

1. Indicate the code of the Class for which Mr. Sharma had booked the ticket ?
2. Indicate the fare basis code applicable to the above fare for Mr. Sharma ?
3. Indicate the type of fare applicable in the above condition ?
4. What is the Global Indicator for the trip that Mr. Sharma is planning ?

1.12 FURTHER READING :

Passenger Fares and Ticketing; <https://www.iata.org/courses>

Fare Basis Code; <https://www.en.m.wikipedia.org>

Air Fares and Airlines Management; Pondicherry University; <https://www.pondiuni.edu.in>



UNIT STRUCTURE

- 2.0 Learning Objectives**
- 2.1 Introduction**
- 2.2 Neutral Unit of Construction**
- 2.3 IATA Rate of Exchange**
- 2.4 How to Apply IATA Rate of Exchange**
 - 2.4.1 Symbols and Abbreviations**
 - 2.4.2 Rounding Procedures**
 - 2.4.3 Interpreting IATA Rate of Exchange Table**
- 2.5 Currency Conversion Table**
- 2.6 Let Us Sum Up**
- 2.7 Answers to Check Your Progress**
- 2.8 Glossary**
- 2.9 Assignment**
- 2.10 Activities**
- 2.11 Case Study**
- 2.12 Further Reading**

2.0 LEARNING OBJECTIVES :

- To identify and understand the airline currency system and its role in Airline ticketing.
- Interpret conversion procedures of the airline currency system.
- To list and enumerate the IATA rate of exchange table for ready reference.

2.1 INTRODUCTION :

You have learnt about Global Indicators, Traffic Conference Areas, Airline Codes and Class in your previous units. In this unit you shall learn about currency conversion that is undertaken in preparation of Airline Tickets. Airlines do not construct fares with the currency of the country. It converts the currency to Neutral Unit of Construction (NUC) and then constructs the fare. Having knowledge about the Neutral Unit of Construction is an essential part of the ticketing process.

2.2 NEUTRAL UNIT OF CONSTRUCTION (NUC) :

The Neutral Unit of Construction is a Private currency used by the airline industry. A private currency is issued by a private entity used for various purposes in different countries as per the laws of the concerned country. The NUC is used for the purpose of conversion and recording fare calculation information and is not used as a legal tender. With over so many currencies in the world conversions

and calculations for airfare in different countries and sectors would be a challenging and cumbersome task for all the stake holders involved in the ticketing process. To address the issue, International Air Transport Association (IATA) from 1st July 1989, introduced the NUC for ticketing purpose; a common denominator used to calculate a total when adding fares in different currencies. The ticket component prices are converted from the original currency (of the country of commencement of travel) and recorded on the airline ticket. The currency is managed by IATA through a set of exchange rates issued every month. As of 2008, the NUC depends on the COC (Country of Commencement) of the travel. Each country that has a strong currency has an IROE (IATA Rate of Exchange) too.

2.3 IATA RATE OF EXCHANGE (IROE) :

IATA Rates of Exchange (IROE) provides monthly updates of IATA currency rates of exchange used by the industry for fare/rate construction. They are built based on the average of the five banking days ending on the 10th of each month. Governed by Passenger Composite Resolution 024c, the IROE enables you to build fares in the Neutral Unit of Construction (NUC). The IATA Rate of Exchange is in a form of a table and there are some interpretations that need to be understood as part of the table.

2.4 HOW TO APPLY IATA RATE OF EXCHANGE TABLE :

2.4.1 Symbols and Abbreviations :

- Symbol 0.000000 shown in the IROE table indicates that no updated information has been received regarding the currency and any previous notification needs to be applied.
- Symbol "NA" stands for Not Applicable in the IROE table. Currency Name and code may be present but no Rate of Exchange is applicable as per IATA notification.
- Symbol "+" indicates that the acceptance of the currency is restricted to the country concerned i.e. journeys commencing or terminating in that country or journeys that both commence and terminate outside that country by the nationals of that country.
- Symbol of **** indicates that the passenger fares and excess baggage charges are established in US Dollars.
- Symbol of '++' indicates that local currency may be accepted only in the country or which it is the national currency for. The journey being undertaken by the nationals and residents of that country but only when travel originates or terminates in that country. The payment of excess baggage in that circumstance is also undertaken when baggage is being either transported from or to the country.
- The refund of documents issued in the local currency shall be made only in the local currency and in the country to which the local currency belongs.

2.4.2. Rounding Procedure :

After converting NUC to the local currency fares and charges are to be calculated beyond one decimal place as shown in the rounding units

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- ❖ **Example :**
- When the rounding unit is a whole number, convert to one decimal place and round up to the next higher unit.
- When the rounding unit is to one decimal place like 0.1, convert the total fare to two decimal places and round up to the next higher unit.
- When the rounding unit is to two decimal places like 0.05, convert the total fare to three decimal places and round up the next higher unit.
- For ticketing purpose all NUC's are shown up to 2 decimals. Decimals beyond two shall be disregarded.
- Fixed tax/fee/charge amounts imposed and specified by Government and/or airport authorities need not be further rounded unless these are converted into another currency where the resulting value is rounded. If not converted to another currency, the original TFC local currency amounts shall be shown on traffic documents without application of the rounding rules shown in the "Other Charges" column.

2.4.3 Interpreting the IATA RATE of Exchange Table :

IATA Rates of Exchange (IROE)

The ROE used to convert NUC into the currency of the country of origin of journey shall be that in effect on the date of ticket issuance.

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Afghanistan	US Dollar	USD	840	1.000000	1	0.1	2	
+	Afghanistan	Afghani	AFN	971	49.500000	1	1	0	2, 8
	Albania	Euro	EUR	978	0.810635	1	0.01	2	

In reference to the above table represented for IATA Rate of Exchange, the following columns denote the following :

Column – 1 : It represents the Limit of the Currency for the country indicated. A '+' sign indicates the restriction of the currency within the country itself. The Afghani is used in Afghanistan only and not in any other country and hence has a + sign in the IROE table whereas a Dollar is used in many countries and do not carry a + sign.

Column – 2 : It is the name of the country from where the currency belongs. Afghani belongs to Afghanistan.

Column – 3 : It indicates the name of the currency.

Column – 4 : It indicates the International Standards Organization (ISO) laid down standard country alpha code.

Column – 5 : It indicates the International Standards Organization (ISO) laid down standard country numeric code.

Column – 6 : It indicates the 1 NUC value of the currency. 1 NUC = 49.500000 Afghani.

Column – 7 : Round off value of other charges that are to be separately calculated.

Column – 8 : Decimal units mentioned are for rounding off. A 2 indicates that the rounding unit is 2 decimal places.

Column – 9 : These are the set of rules as applied by the IATA rule book and are a consideration that falls within the purview of IATA.

□ **Check Your Progress – 1 :**

1. A "+" sign in the IROE table indicates
 - (a) Restriction of the currency within the country to which it belongs
 - (b) Currency is approved across the globe
 - (c) Currency has very high value
2. A NUC value is written in
 - (a) 2 decimal units
 - (b) 3 decimal units
 - (c) 4 decimal units
 - (d) 5 decimal units
3. When the rounding unit is to one decimal place like 0.8
 - (a) Convert the total fare to two decimal places and round up to the next lower unit
 - (b) Convert the total fare to two decimal places and round up to the next higher unit
 - (c) No Rounding Off should be done
4. Symbol of **** indicates
 - (a) Passenger fares and excess baggage charges are established in US Dollars.
 - (b) Passenger fares and excess baggage charges are established in NUC.
 - (c) Passenger fares and excess baggage charges are established in Euro.
5. The refund of documents issued in the local currency
 - (a) Be made in NUC value anywhere in the globe
 - (b) Be made only in the local currency and in the country to which the local currency belongs
 - (c) None of the above
6. The Neutral Unit of Construction is used for
 - (a) Currency Exchange
 - (b) Ticketing Purpose in Airfare
 - (c) Legal Tender
 - (d) All of the Options

2.5 CURRENCY CONVERSION TABLE :

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Afghanistan	US Dollar	USD	840	1.000000	1	0.1	2	
+	Afghanistan	Afghani	AFN	971	49.500000	1	1	0	2, 8
	Albania	Euro	EUR	978	0.810635	1	0.01	2	
+	Albania	Lek	ALL	8	NA	1	1	0	22
+	Algeria	Algerian Dinar	DZD	12	86.906400	10	1	0	
	American Samoa	US Dollar	USD	840	1.000000	1	0.1	2	5
	Angola	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Angola	Kwanza	AOA	973	101.834000	1	1	0	2, 8
	Anguilla	US Dollar	USD	840	1.000000	1	0.1	2	5
	Anguilla	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2, 5
	Antigua Barbuda	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	Antigua Barbuda	US Dollar	USD	840	1.000000	1	0.1	2	5
	Argentina	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Argentina	Argentine Peso	ARS	32	8.546600	1	0.1	2	1, 2, 5
	Armenia	Euro	EUR	978	0.810635	1	0.01	2	
+	Armenia	Armenian Dram	AMD	51	452.500000	1	1	0	8, 22
	Aruba	Aruban Guilder	AWG	533	1.790000	1	1	0	
	Australia	Australian Dollar	AUD	36	1.199437	1	0.1	2	8, 17
	Austria	Euro	EUR	978	0.810635	1	0.01	2	
+	Azerbaijan	Azerbaijani Manat	AZN	944	0.783840	0.01	0.1	2	8, 22
	Azerbaijan	Euro	EUR	978	0.810635	1	0.01	2	
	Bahamas	US Dollar	USD	840	1.000000	1	0.1	2	5
	Bahamas	Bahamian Dollar	BSD	44	NA	1	0.1	2	2
	Bahrain	Bahraini Dinar	BHD	48	0.376100	1	0.1	3	
	Bangladesh	US Dollar	USD	840	1.000000	1	0.1	2	5

Currency Conversion

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Bangladesh	Taka	BDT	50	77.311000	1	1	0	2,19
	Barbados	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Barbados	Barbados Dollar	BBD	52	NA	1	0.1	2	2
+	Belarus	Belarussian Ruble	BYR	974	13834.000000	50	50	0	4, 5, 8
	Belarus	Euro	EUR	978	0.810635	1	0.01	2	
	Belgium	Euro	EUR	978	0.810635	1	0.01	2	
	Belize	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Belize	Belize Dollar	BZD	84	2.000000	1	0.1	2	2
+	Benin	CFA Franc	XOF	952	531.741579	100	100	0	
	Bermuda	Bermudian Dollar	BMD	60	1.000000	1	0.1	2	2, 5
	Bermuda	US Dollar	USD	840	1.000000	1	0.1	2	5
	Bhutan	Ngultrum	BTN	64	61.920600	1	1	0	
	Bolivia, Plurinational State of	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Bolivia, Plurinational State of	Boliviano	BOB	68	6.910000	1	1	0	1, 2, 8
	Bonaire, Saba, Sint Eustatius	US Dollar	USD	840	1.000000	1	0.1	2	5
	Bosnia and Herzegovina	Euro	EUR	978	0.810635	1	0.01	2	
	Bosnia and Herzegovina	Convertible Mark	BAM	977	1.585464	1	1	0	22
	Botswana	Pula	BWP	72	9.391898	1	1	0	25
	Brazil	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Brazil	Brazilian Real	BRL	986	2.589910	0.01	0.01	2	1, 2, 3, 8
	Brunei Darussalam	Brunei Dollar	BND	96	1.316740	1	1	0	
	Bulgaria	Euro	EUR	978	0.810635	1	0.01	2	
+	Bulgaria	Lev	BGN	975	1.585464	0.01	0.01	2	22
+	Burkina Faso	CFA Franc	XOF	952	531.741579	100	100	0	
+	Burundi	Burundi Franc	BIF	108	1564.880000	10	5	0	2, 16

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Burundi	US Dollar	USD	840	1.000000	1	0.1	2	5
	Cambodia	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Cambodia	Riel	KHR	116	NA	10	10	0	2
+	Cameroon	CFA Franc	XAF	950	531.741579	100	100	0	
	Canada	Canadian Dollar	CAD	124	1.141900	1	0.1	2	5, 8, 12
	Cape Verde Islands	Euro	EUR	978	0.810635	1	0.01	2	
+	Cape Verde Islands	Cape Verde Escudo	CVE	132	89.384647	100	100	0	8, 22
	Cayman Islands	US Dollar	USD	840	1.000000	1	0.1	2	5
	Cayman Islands	Cayman Islands Dollar	KYD	136	0.820000	0.1	0.1	2	2, 5
+	Central African Rep.	CFA Franc	XAF	950	531.741579	100	100	0	
+	Chad	CFA Franc	XAF	950	531.741579	100	100	0	
	Chile	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Chile	Chilean Peso	CLP	152	612.235000	1	1	0	2
+	China excluding Hong Kong SAR &	Yuan Renminbi	CNY	156	6.168420	10	1	0	
	Chinese Taipei	New Taiwan Dollar	TWD	901	31.167500	1	1	0	
+	Colombia	Colombian Peso	COP	170	2310.646000	100	100	0	1, 2, 8
	Colombia	US Dollar	USD	840	1.000000	1	0.1	2	5
	Comoros	Comoro Franc	KMF	174	398.806184	100	50	0	
+	Congo	CFA Franc	XAF	950	531.741579	100	100	0	
	Congo, Democratic Republic of	Franc Congolais	CDF	976	NA	1	0.05	3	2, 8
	Congo, Democratic Republic of	US Dollar	USD	840	1.000000	1	0.1	2	5
	Cook Islands	New Zealand Dollar	NZD	554	1.296807	1	0.1	2	8

Currency Conversion

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Costa Rica	US Dollar	USD	840	1.000000	1	0.1	2	5
	Costa Rica	Costa Rican Colon	CRC	188	NA	1	1	0	2, 5
+	Côte d'Ivoire	CFA Franc	XOF	952	531.741579	100	100	0	
	Croatia	Euro	EUR	978	0.810635	1	0.01	2	
	Croatia	Kuna	HRK	191	6.218360	1	1	0	5, 8, 22
	Cuba	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Cuba	Cuban Peso	CUP	192	1.000000	1	0.1	2	2
+	Curacao	Antillian Guilder	ANG	532	1.790000	1	1	0	
	Cyprus	Euro	EUR	978	0.810635	1	0.01	2	
	Czech Republic	Czech Koruna	CZK	203	22.384400	1	1	0	8
	Denmark	Danish Krone	DKK	208	6.031120	1	1	0	
	Djibouti	Djibouti Franc	DJF	262	177.532000	100	100	0	
	Dominica	US Dollar	USD	840	1.000000	1	0.1	2	5
	Dominica	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	Dominican Republic	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Dominican Republic	Dominican Peso	DOP	214	44.088000	1	1	0	2, 8
	Ecuador	US Dollar	USD	840	1.000000	1	0.1	2	5, 23
+	Egypt	Egyptian Pound	EGP	818	7.150050	1	1	2	
	El Salvador	US Dollar	USD	840	1.000000	1	0.1	2	5, 15
+	El Salvador	El Salvador Colon	SVC	222	NA	1	1	2	2, 8, 15
+	Equatorial Guinea	CFA Franc	XAF	950	531.741579	100	100	0	
	Eritrea	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Eritrea	Nakfa	ERN	232	15.750000	1	1	0	2, 8
	Estonia	Euro	EUR	978	0.810635	1	0.01	2	
	Ethiopia	US Dollar	USD	840	1.000000	1	0.1	2	5

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Ethiopia	Ethiopian Birr	ETB	230	20.143700	1	1	0	2, 8
	Falkland Islands (Malvinas)	Falkland Pound	FKP	238	0.638555	1	0.1	2	
	Faroe Isl.	Danish Krone	DKK	208	6.031120	1	1	0	
	Fiji Islands	Fiji Dollar	FJD	242	1.974408	1	0.1	2	8
	Finland	Euro	EUR	978	0.810635	1	0.01	2	
	France	Euro	EUR	978	0.810635	1	0.01	2	
	French Guiana	Euro	EUR	978	0.810635	1	0.01	2	
	French Polynesia	CFP Franc	XPF	953	96.734430	100	10	0	
+	Gabon	CFA Franc	XAF	950	531.741579	100	100	0	
	Gambia	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Gambia	Dalasi	GMD	270	NA	1	0.1	2	2, 8
+	Georgia	Lari	GEL	981	1.902040	1	0.1	2	8, 22
	Georgia	Euro	EUR	978	0.810635	1	0.01	2	
	Germany	Euro	EUR	978	0.810635	1	0.01	2	
	Ghana	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Ghana	Ghana Cedi	GHS	936	3.218550	1	0.1	2	2, 8
	Gibraltar	Gibraltar Pound	GIP	292	0.638555	1	0.1	2	5
	Greece	Euro	EUR	978	0.810635	1	0.01	2	
	Greenland	Danish Krone	DKK	208	6.031120	1	1	0	8
	Grenada	US Dollar	USD	840	1.000000	1	0.1	2	5
	Grenada	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	Guadeloupe	Euro	EUR	978	0.810635	1	0.01	2	
	Guam	US Dollar	USD	840	1.000000	1	0.1	2	5
	Guatemala	US Dollar	USD	840	1.000000	1	0.1	2	5
	Guatemala	Quetzal	GTQ	320	7.638300	1	0.1	2	2, 8
	Guinea	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Guinea	Guinea Franc	GNF	324	7030.000000	100	100	0	2, 8
+	Guinea Bissau	CFA Franc	XOF	952	531.741579	100	100	0	

Currency Conversion

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Guyana	Guyana Dollar	GYD	328	NA	1	1	0	2
	Guyana	US Dollar	USD	840	1.000000	1	0.1	2	5
	Haiti	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Haiti	Gourde	HTG	332	NA	1	0.5	2	2
	Honduras	Lempira	HNL	340	21.147000	1	0.2	2	2
	Honduras	US Dollar	USD	840	1.000000	1	0.1	2	5
	Hong Kong SAR, China	Hong Kong Dollar	HKD	344	7.751830	10	1	0	
+	Hungary	Forint	HUF	348	268.789000	100	100	0	8
	Iceland	Iceland Krona	ISK	352	124.512000	100	10	0	
+	India	Indian Rupee	INR	356	61.920600	5	1	0	8, 10
	Indonesia	US Dollar	USD	840	1.000000	1	0.1	2	5
	Indonesia	Rupiah	IDR	360	12323.700000	1000	100	0	1, 2, 8
+	Iran, Islamic Republic of	Iranian Rial	IRR	364	33544.000000	1000	1000	0	19
+	Iraq	Iraqi Dinar	IQD	368	1158.000000	0.1	0.05	3	2
	Iraq	US Dollar	USD	840	1.000000	1	0.1	2	5
	Ireland	euro	EUR	978	0.810635	1	0.01	2	
	Israel	US Dollar	USD	840	1.000000	1	0.1	2	5, 10
	Israel	New Israeli Sheqel	ILS	376	3.963120	1	1	0	2, 5, 8
	Italy	euro	EUR	978	0.810635	1	0.01	2	
	Jamaica	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Jamaica	Jamaican Dollar	JMD	388	NA	1	1	0	2
	Japan	Yen	JPY	392	120.063000	100	10	0	7, 24
	Jordan	Jordanian Dinar	JOD	400	0.707510	0.1	0.05	2	
+	Kazakhstan	Kazakhstan Tenge	KZT	398	182.010000	1	1	0	8
	Kenya	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Kenya	Kenyan Shilling	KES	404	90.430000	5	5	0	2
	Kiribati	Australian Dollar	AUD	36	1.199437	1	0.1	2	

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Korea, Democratic People's Republic of	North Korean Won	KPW	408	100.790000	1	1	0	
	Korea, Republic of	Won	KRW	410	1111.900000	100	100	0	
	Kuwait	Kuwaiti Dinar	KWD	414	0.291853	1	0.05	3	
	Kyrgyzstan	euro	EUR	978	0.810635	1	0.01	2	
+	Kyrgyzstan	Som	KGS	417	57.643500	1	0.1	2	8, 22
+	Lao (People's Dem. Rep.)	Kip	LAK	418	8072.900000	10	10	0	2
	Lao (People's Dem. Rep.)	US Dollar	USD	840	1.000000	1	0.1	2	5
	Latvia	euro	EUR	978	0.810635	1	0.01	2	
	Lebanon	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Lebanon	Lebanese Pound	LBP	422	NA	100	100	0	2, 8
	Lesotho	Loti	LSL	426	11.366200	10	1	0	6
+	Liberia	Liberian Dollar	LRD	430	NA	1	0.1	2	2
	Liberia	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Libya	Libyan Dinar	LYD	434	1.197260	0.1	0.05	3	19
	Liechtenstein	Same as Switzerland	CHF	756	0.974740	1	0.5	2	8
	Lithuania	euro	EUR	978	0.810635	1	0.01	2	
	Luxembourg	euro	EUR	978	0.810635	1	0.01	2	
	Macao SAR, China	Pataca	MOP	446	7.984385	10	1	0	
	Macedonia (FYROM)	euro	EUR	978	0.810635	1	0.01	2	
+	Macedonia (FYROM)	Macedonian Denar	MKD	807	49.897000	1	1	0	5, 8, 22
	Madagascar	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Madagascar	Ariary	MGA	969	2634.900000	100	100	0	2
	Malawi	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Malawi	Kwacha	MWK	454	489.742000	1	0.1	2	2, 8

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Malaysia	Malaysian Ringgit	MYR	458	3.474800	1	1	2	8, 27
	Maldives Isl.	Rufiyaa	MVR	462	15.440000	1	1	0	2
	Maldives Isl.	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Mali	CFA Franc	XOF	952	531.741579	100	100	0	
	Malta	euro	EUR	978	0.810635	1	0.01	2	
	Marshall Isl.	US Dollar	USD	840	1.000000	1	0.1	2	5
	Martinique	euro	EUR	978	0.810635	1	0.01	2	
+	Mauritania	Ouguiya	MRO	478	289.335000	20	10	0	
+	Mauritius	Mauritius Rupee	MUR	480	31.637000	5	1	0	
	Mayotte	euro	EUR	978	0.810635	1	0.01	2	
	Mexico	Mexican Peso	MXN	484	14.289240	1	1	0	2, 8
	Mexico	US Dollar	USD	840	1.000000	1	0.1	2	5
	Micronesia, Federated States of	US Dollar	USD	840	1.000000	1	0.1	2	5
	Moldova, Republic of	euro	EUR	978	0.810635	1	0.01	2	
+	Moldova, Republic of	Moldovan Leu	MDL	498	15.111000	1	1	0	8, 22
	Monaco	euro	EUR	978	0.810635	1	0.01	2	
	Mongolia	Tugrik	MNT	496	1876.200000	100	100	0	2
	Mongolia	US Dollar	USD	840	1.000000	1	0.1	2	5
	Montenegro	Euro	EUR	978	0.810635	1	0.1	2	
	Montserrat	US Dollar	USD	840	1.000000	1	0.1	2	5
	Montserrat	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2, 5
+	Morocco	Moroccan Dirham	MAD	504	8.929100	5	1	0	8
+	Mozambique	Metical	MZN	943	32.528000	10	1	0	8
	Myanmar	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Myanmar	Kyat	MMK	104	1028.900000	1	1	0	2
	Namibia	Namibia Dollar	NAD	516	11.366200	10	1	0	6, 8
	Nauru	Australian Dollar	AUD	36	1.199437	1	0.1	2	

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Nepal	Nepalese Rupee	NPR	524	99.072960	1	1	0	
	Netherlands	Euro	EUR	978	0.810635	1	0.01	2	11
	New Caledonia	CFP Franc	XPF	953	96.734430	100	10	0	
	New Zealand	New Zealand Dollar	NZD	554	1.296807	1	0.1	2	8, 18
+	Nicaragua	Cordoba Oro	NIO	558	26.543000	1	1	0	1, 2
	Nicaragua	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Niger	CFA Franc	XOF	952	531.741579	100	100	0	
	Nigeria	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Nigeria	Naira	NGN	566	181.160000	1	1	0	2
	Niue	New Zealand Dollar	NZD	554	1.296807	1	0.1	2	
	Norfolk Isl.	Australian Dollar	AUD	36	1.199437	1	0.1	2	
	North Mariana Isl.	US Dollar	USD	840	1.000000	1	0.1	2	5
	Norway	Norwegian Krone	NOK	578	7.690940	1	1	0	
	Oman	Rial Omani	OMR	512	0.384500	1	0.1	3	
+	Pakistan	Pakistan Rupee	PKR	586	101.220000	10	1	0	9
	Palau	US Dollar	USD	840	1.000000	1	0.1	2	5
	Palestinian Territory, Occupied	US Dollar	USD	840	1.000000	1	0.1	2	5
	Panama	US Dollar	USD	840	1.000000	1	0.1	2	5
	Panama	Balboa	PAB	590	1.000000	1	0.1	2	2
	Papua New Guinea	Kina	PGK	598	2.576748	1	0.1	2	
+	Paraguay	Guarani	PYG	600	NA	100	100	0	2, 20
	Paraguay	US Dollar	USD	840	1.000000	1	0.1	2	5
	Peru	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Peru	Nuevo Sol	PEN	604	2.953700	0.1	0.1	2	2, 8
+	Philippines	Philippine Peso	PHP	608	44.595200	1	1	0	2
	Philippines	US Dollar	USD	840	1.000000	1	0.1	2	5
	Poland	Zloty	PLN	985	3.627500	1	0.01	2	8

Currency Conversion

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Portugal incl Azores, Madeira	Euro	EUR	978	0.810635	1	0.01	2	
	Puerto Rico	US Dollar	USD	840	1.000000	1	0.1	2	5
	Qatar	Qatari Rial	QAR	634	3.640000	10	10	0	
	Reunion Isl.	euro	EUR	978	0.810635	1	0.01	2	
	Romania	euro	EUR	978	0.810635	1	0.01	2	
	Romania	New Leu	RON	946	3.596760	1	1	2	8, 22
	Russia	Russian Ruble	RUB	643	61.682500	5	1	0	8, 22
	Russia	euro	EUR	978	0.810635	1	0.01	2	8, 22
	Rwanda	US Dollar	USD	840	1.000000	1	0.1	2	5, 13
+	Rwanda	Rwanda Franc	RWF	646	690.300000	10	5	0	2, 13
	Saint Kitts, Nevis	US Dollar	USD	840	1.000000	1	0.1	2	5
	Saint Kitts, Nevis	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	Saint Lucia	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	Saint Lucia	US Dollar	USD	840	1.000000	1	0.1	2	5
	Samoa	Tala	WST	882	2.390115	1	0.1	2	8
+	Sao Tome and Principe	Dobra	STD	678	NA	100	100	0	2, 8
	Sao Tome and Principe	US Dollar	USD	840	1.000000	1	0.1	2	5
	Saudi Arabia	Saudi Riyal	SAR	682	3.752900	1	1	0	
+	Senegal	CFA Franc	XOF	952	531.741579	100	100	0	
+	Serbia	Serbian Dinar	RSD	941	98.720000	1	1	0	5, 8, 22
	Serbia	euro	EUR	978	0.810635	1	0.01	2	
+	Seychelles	Seychelles Rupee	SCR	690	14.158990	1	1	2	
+	Sierra Leone	Leone	SLL	694	NA	1	0.1	2	2, 8
	Sierra Leone	US Dollar	USD	840	1.000000	1	0.1	2	5
	Singapore	Singapore Dollar	SGD	702	1.316740	1	0.1	2	
	Slovakia	euro	EUR	978	0.810635	1	0.01	2	

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System**

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Slovenia	euro	EUR	978	0.810635	1	0.01	2	
	Solomon Islands	Solomon Island Dollar	SBD	90	7.447951	1	0.1	2	
+	Somalia	Somali Shilling	SOS	706	715.900000	1	1	0	1, 2
	Somalia	US Dollar	USD	840	1.000000	1	0.1	2	5
	South Africa	Rand	ZAR	710	11.366200	10	1	2	6, 8, 26
+	South Sudan	South Sudanese Pound	SSP	728	3.500000	1	1	2	
	Spain incl. Canary Islands	euro	EUR	978	0.810635	1	0.01	2	
+	Sri Lanka	Sri Lanka Rupee	LKR	144	131.160000	100	1	0	
	St. Maarten	Antillian Guilder	ANG	532	1.790000	1	1	0	
	St. Pierre Miquelon	Euro	EUR	978	0.810635	1	0.01	2	
	St. Vincent and the Grenadines	East Caribbean Dollar	XCD	951	2.700000	1	0.1	2	2
	St. Vincent and the Grenadines	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Sudan	Sudanese Pound	SDG	938	5.700000	1	1	2	19
	Suriname	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Suriname	Surinam Dollar	SRD	968	3.300000	1	1	0	2
	Swaziland	Lilangeni	SZL	748	11.366200	10	1	0	6
	Sweden	Swedish Krona	SEK	752	7.539530	1	1	0	
	Switzerland	Swiss Franc	CHF	756	0.974740	1	0.5	2	
+	Syrian Arab Republic	Syrian Pound	SYP	760	197.640000	1	1	0	19
+	Tajikistan	Somoni	TJS	972	5.228250	1	0.1	2	8, 11
	Tajikistan	Euro	EUR	978	0.810635	1	0.01	2	
	Tanzania, United Republic of	US Dollar	USD	840	1.000000	1	0.1	2	5

Currency Conversion

Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
+	Tanzania, United Republic of	Tanzania Shilling	TZS	834	1746.400000	10	10	0	2
	Thailand	Baht	THB	764	32.930000	5	5	0	8
	Timor Leste	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Togo	CFA Franc	XOF	952	531.741579	100	100	0	
+	Tonga Isl.	Pa'anga	TOP	776	1.916224	1	0.1	2	8
	Trinidad and Tobago	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Trinidad and Tobago	Trinidad & Tobago	TTD	780	6.356870	1	1	0	2
+	Tunisia	Tunisian Dinar	TND	788	1.857970	1	0.5	3	
	Turkey	Turkish Lira	TRY	949	2.253840	1	0.01	2	8,22
	Turkey	US Dollar	USD	840	1.000000	1	0.1	2	5
	Turkmenistan	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Turkmenistan	Turkmenistan New	TMT	934	3.284050	1	0.1	2	2, 8
	Turks and Caicos Isl.	US Dollar	USD	840	1.000000	1	0.1	2	5
	Tuvalu	Australian Dollar	AUD	36	1.199437	1	0.1	2	
	Uganda	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Uganda	Uganda Shilling	UGX	800	2762.800000	1	1	0	2, 8
	Ukraine	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Ukraine	Hryvnia	UAH	980	15.468380	1	1	0	2, 8
	United Arab Emirates	UAE Dirham	AED	784	3.673050	10	10	0	
	United Kingdom	Pound Sterling	GBP	826	0.638555	1	0.1	2	5
	United States of America/ UST	US Dollar	USD	840	1.000000	1	0.1	2	4
	Uruguay	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Uruguay	Peso Uruguayo	UYU	858	24.000000	1	1	0	1, 2, 5, 8
+	Uzbekistan	Uzbekistan Sum	UZS	860	2407.114000	1	1	0	8, 22

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Lim	Country	Currency Name	ISO Code Alpha	ISO Code Numeric	From NUC	Local Curr. Fares	Other Charges	Decimal Units	Notes
	Uzbekistan	Euro	EUR	978	0.810635	1	0.01	2	5
	Vanuatu	Vatu	VUV	548	100.447000	100	10	0	
	Venezuela, Bolivarian Republic of	US Dollar	USD	840	1.000000	1	0.1	2	5
	Venezuela, Bolivarian Republic of	Bolivar Fuerte	VEF	937	12.000000	0.01	0.01	2	2, 5, 8
+	Viet Nam	Dong	VND	704	21349.000000	1000	1000	0	2
	Viet Nam	US Dollar	USD	840	1.000000	1	0.1	2	5
	Virgin Islands (British)	US Dollar	USD	840	1.000000	1	0.1	2	5
	Virgin Islands (US)	US Dollar	USD	840	1.000000	1	0.1	2	4, 5
	Wallis and Futuna Isl.	CFP Franc	XPF	953	96.734430	100	10	0	
	Yemen	Yemeni Rial	YER	886	215.000000	1	1	0	19
	Zambia	US Dollar	USD	840	1.000000	1	0.1	2	5, 9
+	Zambia	Kwacha	ZMW	967	6.359000	5	5	0	2, 8
	Zimbabwe	US Dollar	USD	840	1.000000	1	0.1	2	5
+	Zimbabwe	Zimbabwe Dollar	ZWR	935	NA	1	1	2	2

(The currency conversion table is published by IATA and in the unit the source for the same is www.financedocbox.com)

2.6 SUMMARY :

With so many currencies across the globe from different countries it would be a very difficult task for airlines to issue tickets in every currency and keep a control on the same. To ease the global ticketing, IATA introduced a fictitious or private currency known as the Neutral Unit of Construction (NUC) for conversion and recording airfare calculation. IATA as a regulating body issues the Rate of Exchange for currencies against the NUC every month in its IATA Rate of Exchange (IROE). The module will acquaint you with the NUC and the rate of conversion of a local currency to a NUC from the data table as provided for reference.

2.7 ANSWERS TO CHECK YOUR PROGRESS :

1. Restriction of the currency within the country to which it belongs
2. 5 decimal units
3. Convert the total fare to two decimal places and round up to the next higher unit

4. Passenger fares and excess baggage charges are established in US Dollars.
5. Be made only in the local currency and in the country to which the local currency belongs
6. Ticketing Purpose in Airfare

2.8 GLOSSARY :

- COC :** Country of Commencement
NUC : Neutral Unit of Construction
ISO : International Standards Organization
IROE : IATA Rate of Exchange

2.9 ASSIGNMENT :

❖ **Indicate True or False for the under mentioned sentences :**

Sentence	True/False
NUC is a legal tender in many countries	
IATA rate of exchange updates currency rate of exchange used by the industry for fare/rate construction	
For ticketing purpose NUC is shown up to 3 decimals	
ISO stands for International Standards Organization	
The NUC depends on the Country of commencement of journey	

❖ **Explain the following symbols used in Fare construction :**

Symbols	Interpretation

+	
++	
NA	
0.000000	

2.10 ACTIVITIES :

Check the IROE Table of conversion and convert ticket prices from 10 different countries to NUC value.

List the countries in which payment for a flight ticket can be done in USD and Euro as a local currency.

2.11 CASE STUDY :

Mr. Ban Su booked a ticket from Bangkok in Thailand to Osaka in Japan. The price of the ticket was 4500 Baht for the given itinerary.

1. Convert the price of the Ticket to NUC unit by looking up in the Table ?
2. Indicate the ISO alpha and numeric code for Thailand ?

2.12 FURTHER READING :

IATA Exchange Rates terms and conditions; <https://www.iata.org>

IATA Consolidated Exchange Rates; <https://www.iata.org>

IATA Clearing Services Exchange Rates; <https://www.iata.org>

Neutral Unit of Construction; <https://en.m.wikipedia.org>

<https://www.alanpedia.com>

Building Fare Calculation; Fadil; <https://www.slideshare.net>

Worldwide Fares–Passenger Air Tariff; <https://www.passengertariff.com>



UNIT STRUCTURE

- 3.0 Learning Objectives
- 3.1 Introduction
- 3.2 Manual or Paper Tickets
- 3.3 Electronic Tickets
- 3.4 Advantages of Electronic Tickets
- 3.5 Passenger Name Record
- 3.6 Check in procedures
- 3.7 Limitation of electronic tickets
- 3.8 Documents of Travel
- 3.9 Let Us Sum Up
- 3.10 Answers to Check Your Progress
- 3.11 Glossary
- 3.12 Assignment
- 3.13 Activities
- 3.14 Case Study
- 3.15 Further Reading

3.0 LEARNING OBJECTIVES :

- To identify and understand the types of tickets for the airline industry.
- To list and detail out manual ticketing system and its use.
- To list, detail and understand Electronic ticketing system prevalent in the airline industry.
- To acquaint with the check in procedures that is followed with the ticket.

3.1 INTRODUCTION :

Airline ticket is a proof of journey for a passenger on a flight as mentioned. An airline ticket may be issued by an airline or a travel agency. Airline tickets may be

- (a) A Manual Ticket consisting of coupons and vouchers
- (b) An Electronic ticket or E Ticket.

3.2 MANUAL OR PAPER TICKETS :

It was in the 1920's that the Manual or Paper tickets came into use and every airline used a various forms of ticket with different set of rules. There was a need for standardisation of procedural requirements, documentation and regulation of various processes for the industry. It was until the IATA Traffic Committee in 1930 introduced the first standard hand-written ticket for multiple

Computer Reservation System

trips. The standards laid down by the committee prevailed in the industry till early 1970s. Automation in 1972 brought a new change in the ticketing aspect in airlines. The Neutral Paper ticket was designed by IATA and introduced that year. The Neutral Ticket carried the logo of IATA on the top cover instead of airline logos. This ticket was now to be used by the travel agents for booking on any airline across the world. The storage of information of a ticket in a ticket was discovered through electronic innovation in 1983 with the introduction of the magnetic stripe on the back of a ticket. The Magnetic stripe served a dual purpose of a airline ticket as well that of a boarding pass for the airline. IATA printed around 285 million neutral tickets both Paper and Magnetic stripe variations by 2005.

ISSUED BY: PASSENGER TICKET AND BAGGAGE CHECK
SUBJECT TO CONDITIONS OF CONTRACT ON PAGE 2

Biman BANGLADESH AIRLINES

31/1/14 7/1/14 JAX CE

Biman 16-3 9804 1

CLASS	CARRIER	FLIGHT CLASS	DATE	FARE BASIS	FARE	STATUS	REMARKS
	BG	073	KH/14/14	Y RT			TOKYO
	BG	072	KH/14/14	Y RT			SINGAPORE
							TOKYO

997 4202405280 3

NON REFUNDABLE

In 1972, IATA introduced the Neutral Paper Ticket. The Neutral Paper Ticket had no brand logo of the airline on the ticket; instead it carried the logo of IATA. The process of ticket sales, reporting and collection of remittances were carried by IATA. The Manual Paper ticket was issued as a booklet and had several parts.

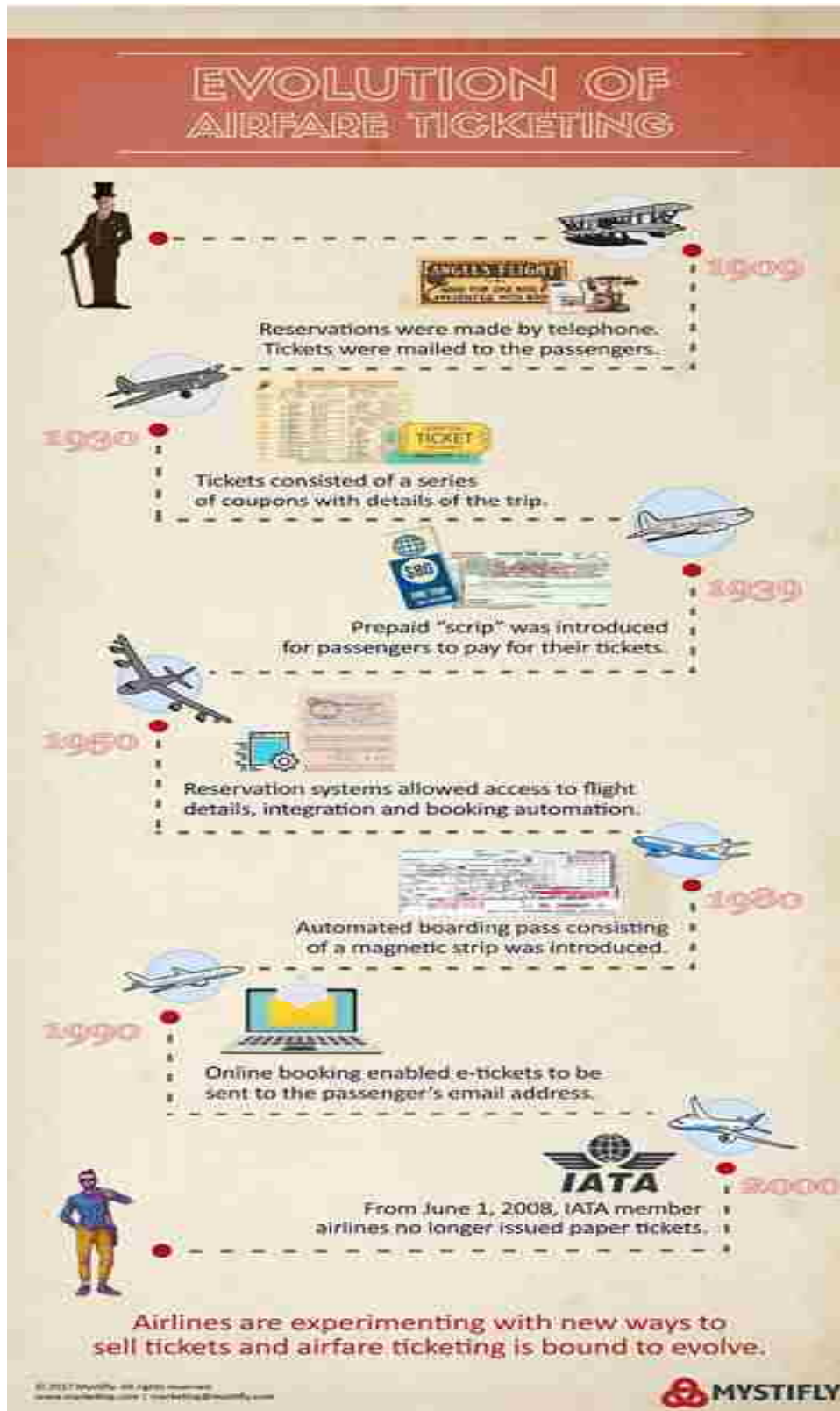
- **Audit Coupon :** It was the Top sheet of the Ticket that was used for official purpose by the head quarter of the airline.
- **Agent Coupon :** The second sheet was for the travel agent who was issuing the ticket for his reference.
- **Control Coupon :** The third sheet was the control coupon and was filed together with the audit coupon for the use by the airline.
- **Flight Coupon :** This was the fourth sheet that was retained in the booklet to be used by the passenger. It was only torn by the respective flight staff at the airport. Maintaining the passenger coupon was essential to every passenger. A lost passenger coupon prevented the passenger to commence the journey.

The Neutral Paper Ticket led to the phasing out of Hand Written Paper tickets. This was the beginning of automation of ticketing. Airline tickets at a certain stage came with magnetic stripes where four tracks carried encoded data of the sale of a ticket. The data was read from the ticket at the airport through a magnetic stripe reader.

Apart from the coupons that were part of the booklet any service that the passenger availed apart from the flight ticket like payment for extra baggage during the ticket booking process was charged on a Miscellaneous Charges Order (MCO). There were several additional coupons of the Miscellaneous Charges Order attached to the ticket booklet for such additional services and each coupon

was attached for a different service. If any additional service was charged part of any tour, Miscellaneous Charges Orders were prepared for every service but the passenger copy did not carry the value charged for the service. Miscellaneous Charges Orders were printed blank by IATA without any airline information in its Neutral Tickets. The Miscellaneous Charges Orders were valid for a period of One Year.

On June 1st, 2008, IATA announced that its member airlines would no longer issue paper tickets.



3.3 ELECTRONIC TICKETS :

An Electronic ticket is also referred to as an E ticket is a ticket that is purchased to book a seat in the aircraft over the web or over a phone. It is a paperless electronic document. United Airlines was the first Airline to introduce Electronic tickets way back in 1994. By 2004, only 20% of the airlines moved to the electronic medium of ticketing. The Multilayered paper tickets were in use for long until in 2008, IATA stopped the sale of manual paper tickets. The initiative was driven by IATA with an objective of simplifying the business and switches the entire airline industry into 100 % electronic ticketing. The IATA board of governors had set a deadline from 2004 to introduce and complete the transition by 2007 with tickets being processed through the IATA Billing and Settlement Plan (BSP). Paper Tickets were in circulation till 2009 as the Industry could not comply to the norms so fast.



The electronic ticket carries the following information :

- The name of the passenger(s).
- The airline issuing the ticket.
- The 3 digit code of the Airline
- The ticket number beginning with the 3 digit code of the airline.
- The origin and destination city mentioned in the ticket.
- The Flight Code and Flight Number (Not mentioned for an open ticket).
- The allowance baggage permissible.
- The Fare calculated for the ticket with the Tax components and breakdown. (This is often not printed in a ticket but is in the record of the airline).
- Any alpha or alpha-numeric Fare identifier code.
- Refund Procedures.
- Dates of commencement of Journey.
- The mode of payment. It is essential to mention the same because if the ticket is cancelled and refunded it will be done in the same mode.

- The Rate of Exchange used. (Applicable for any international parts of the fare and taxes).

Once a reservation is confirmed the record of the booking is kept in the Computer Reservation system of the airlines. Passengers can take a print of the ticket of the electronic ticket. Airlines or Travel agencies mail the tickets to customers for their ease of print and modern day bookings enable the customer to receive confirmations of their bookings and updates as text messages on the registered mobile phone number during the booking process.

3.4 ADVANTAGES OF ELECTRONIC TICKETS :

The Electronic ticket offers many advantages for both travellers and airlines. They include security, flexibility, cost and convenience. Some of the benefits are :

- (a) An E ticket can never be lost as it is present in the Computer Reservation System of the airline and can always be retrieved.
- (b) A person with proper identification can only use an E ticket and is of considerable security value on part of the traveller as well as the airline.
- (c) Changes of itineraries are easy in an E ticket where the database needs to be updated in the Computer Reservation System.
- (d) With Paperless system the Industry has saved a lot of money on paper and printing.
- (e) Ticketing by means of electronic medium has become fast saving a lot of time and energy for the traveller.
- (f) The airlines can continuously communicate with the passengers after the sales for any changes in the flight, cancellations or any other adjustments. Real time communication is also enabled by some airlines based on plug-ins that passengers can install in their devices to communicate with the airlines.
- (g) Passengers can pre-book in flight necessities like food or Extra baggage or Seat of their choice during a booking process.
- (h) Airlines with database of travellers can undertake promotional activities for future offers.
- (i) Airlines can enrol passengers as part of their loyalty programs

□ Check Your Progress – 1 :

1. A passenger if losing an E ticket
 - (a) Cannot board a flight
 - (b) Can board a flight but has to pay extra
 - (c) The ticket gets cancelled
 - (d) None of the options
2. Baggage Allowances are
 - (a) Mentioned on an E ticket
 - (b) Notified at the Airport
 - (c) Not Mentioned in an E Ticket

Computer Reservation System

3. The sale of Paper Tickets were stopped by IATA from
 - (a) 1st June 1998
 - (b) 1st June 2008
 - (c) 1st June 2009
 - (d) 1st June 2018
4. A Neutral Paper Ticket carried
 - (a) The Airline Logo
 - (b) The ICAO Logo
 - (c) The IATA Logo
 - (d) No Logo

3.5 PASSENGER NAME RECORD (PNR) :

A Passenger Name Record or PNR is the data that is stored in the Terminals of the Airline. PNR is created by the system through an unique code for each itinerary and the data can be accessed through this code. There is no strict Industry standard for the structure or type of information that needs to be included with a PNR. The following are the essential information to a PNR and is required before a booking is made. They are

- The Passenger's Name
- Address and Telephone Number of the Travel Agent or Airline Office
- The name of the person providing the information
- The ticket details (Ticket number)
- The itinerary (For at least one segment)

After the booking is complete, the Computer Reservation System will issue a unique all alpha or an alpha numeric PNR which will remain the same regardless of any change made to the itinerary. A lot of other supplementary information of the traveller is mandatory as per government directives of various countries before the PNR is generated.

3.6 CHECK-IN PROCEDURES :

Check In procedure is the first procedure for passengers at the airport that is handled by the airline. Check In procedures are time bound and mandated by airlines in consultation with the government of the country for both domestic and international travel. During the process the first process that is undertaken is the Passenger Identity Registration where valid documents pertaining to the passenger along with the E ticket are checked and verified. Some airlines even ask for credit cards used for payment for security reasons. The next process that is undertaken is the Baggage Registration and issuing of a Boarding Pass which is a mandatory document for boarding an aircraft. Every airline has a stipulated weight specification to be carried by passengers. Some airlines have a self service baggage drop machines for passengers.

❖ Online Check In :

The type of Check In is undertaken by the passenger over the internet and is also known as Web Check In. The service is promoted by aircrafts where the passenger can print his own boarding pass. Depending on airlines, passengers can select meal options, seat preferences, baggage quantities and other services as provided by the airline during the online Check in process. The service is extended to passengers by the airline to reduce the time that passenger undertakes at the airport for a Check in counter. Many airlines may require passengers to proceed to Check In counters after an online Check in also or separate counters

may be allocated for online passengers. Online check in happens at a stipulated time as allocated by the airline and normally it starts 24 to 48 hours prior to the departure time of the flight. The process of online Check In was promoted by Alaska Airlines in 1999 and is now followed by all airline operators. A lot of airlines have made it a rule to mandatorily undertake Online Check In process to waive off a fee which they charge over the counter for Check Ins undertaken. The 3D barcode technology used in the Online Check in process was first introduced by British Airways. Many airlines have their own applications that are suited to mobile phones from which the Check in process can be undertaken easily.

Self Service Kiosks at airport terminals are used for self Check In by passengers. The Self Service kiosks are placed in the airport terminal building and passengers can select the particular airline they are travelling in and enter the PNR number. The Kiosk retrieves the data of the passenger and prints a Boarding card for the passenger with a 3D barcode.

❖ **Premium Check In :**

The facility is offered to passengers who carry a First Class or a Business Class ticket. A lot of airports and airlines have special lounge for these passengers where the procedure of Check in is undertaken without waiting. A lot of airlines offer separate counters for these passengers to facilitate a speedy process. The facility is also given by many airlines to passengers who have been enrolled under their various loyalty programs and Frequent Flyer programs. The services and the facilities offered for Premium Check in depend completely on the airlines.

❖ **In Town Check In :**

A lot of airports have a railway network connected to the airport. To facilitate smooth travel, passengers are allowed to do a check in process at these railway terminals and drop their baggage. The facility helps passengers to take a train to the airport without carrying their luggage along. The facility is available at New Delhi Airport in India and in many cities across the globe.

3.7 LIMITATIONS OF ELECTRONIC TICKETS :

Though Electronic tickets have lesser limitations and challenges there may be issues pertaining to technical glitches and software incompatibility between code share flights.

Code Sharing is a common marketing practice undertaken through a business arrangement by two airlines, where two or more airlines publish and market the same flight under their own flight number (airline flight code). In a Code Share agreement, a flight may be operated by one particular airline, while seats for the flight are sold by all the airlines that have undertaken a code share agreement using their own flight number (airline flight code). Code Share is a common feature for optimizing airline sales and there are major alliances undertaken to promote code sharing.

With electronic tickets not interlined often due to non-agreement of interlining and use of different global distribution systems, both carriers may not be able to exchange data on tickets issued to the passenger. The same then is undertaken through a manual process. Industry discount tickets also tend to be issued on paper if they are valid for more than one airline that does not have an interlining agreement.

Usually there is very limited information on the E–ticket coupon. So in case of the reservation system malfunction, there might be complications if a passenger needs to change an electronic ticket. It is difficult to reissue an electronic ticket on grounds where a passenger needs to be shifted to another airline due to cancellation of the flight scheduled. Different Airlines operate on different reservation systems, processes and networks leading to incompatibility.

3.8 DOCUMENTS FOR AIR TRAVEL :

International travel is an experience for travellers and every country has formulated protocols and rules related to International travellers. Travellers have to abide by the regulations of their host country and also of the country of visit. There are certain mandatory documents that travellers need to carry for International travel as an essential element of their travel. The documents are

- (a) **Passport :** A passport is a travel document issued by the government of any country to its citizens, which certifies the identity and nationality of the holder. In India a passport is issued by the Ministry of External Affairs to Indian citizens for the purpose of International travel. Passports issued in India have several categories and the categories are distinguished by the colour of the cover of the passport.

Ordinary Passport : Dark Blue Cover

Official Passport : White Cover

Diplomatic Passport : Maroon Cover

A standard Indian passport contains 36 pages and the following information is provided

❖ **BIODATA PAGE :**

- The Type of Passport (P, D or S)
- Country Code(IND)
- Passport Number
- Surname
- Given Name
- Sex
- Date of Birth
- Place of Birth
- Place of Issue
- Date of Issue
- Date of Expiry
- Photo of the Passport Holder
- Ghost Picture of the Passport Holder (Security feature since 2013)
- Signature of the Passport Holder
- Machine Readable Passport Zone (MRZ)

❖ **DEMOGRAPHICS PAGE :**

- Name of Father or Legal Guardian
- Name of Mother

- Name of Spouse
- Address
- Old Passport Number
- File Number

All Passports contain a note bearing page typically stamped and signed by the issuing authority in the name of The President of The Republic of India. The text of the Indian passport is printed in both Hindi and English, the two official languages of India.

An Indian Passport carries two stamps

ECR : Emigration Check Required (This type of passports need a clearance from the Government of India's Protector of Emigrants when going to selected countries on work visa)

ECNR : Emigration Check Not Required (This type of passport is issued to Indian nationals holding a matriculation certificate. There are a lot of other criteria for issuing a ECNR passport.

As of June 2020, Henley Passport Index ranks Indian passport at 85th place with visa free or visa on arrival access to 58 nations to Indian citizens.

- (b) **Visa** : Visa is a conditional authorization granted by a respective country to a foreigner allowing them to enter, remain within, or to leave that country. A visa is subject to entry permission and is issued by the consulate of every country and can be revoked any time. A visa most commonly takes the form of a sticker endorsed in the applicant's passport or other travel document. In India, any foreigner who wish to visit the country for the sole objective of recreation, sightseeing , casual visit to meet family and friends, attending a short term yoga program are issued an e– Tourist Visa. E Tourist visa in India is valid for a period of 60 days. A Visa on Arrival is only permitted to Japanese nationals at certain entry points in India.
- (c) **Overseas Medical Insurance** : Travel Health insurance of Travel Medical Insurance provides coverage to overseas travellers from any medical contingencies or emergency evacuations abroad. As medical expenses at a lot of countries are expensive and if a traveller falls sick at any destination, the cost of medical expenses can be very high. A Travel Medical Insurance provides Cashless Hospitalization and 24X7, medical assistance. A Travel Medical Insurance can be single trip or multi trip also. It is mandatory to buy Travel Health Insurances before travelling to a lot of countries as per the directives of the country. Travel Health Insurances in India are offered by a lot of companies in the Insurance sector.
- (d) **Foreign Exchange** : While travelling abroad any International traveller must have foreign currency in possession to meet the expenses incurred during the stay abroad. The foreign currency regulations are set by the Reserve Bank of India for our country. Normally in India Foreign Exchange can be purchased 180 days prior to the travel date from an authorized person or dealer. Forex exchanges up to Rs 50,000 can be done in cash and amount equivalent or above it are handled through other modes as specified by the Reserve Bank of India. The possession of a valid passport and visa is required during exchanging currency. There are other modes of carrying foreign currency also like Forex cards, travel cards etc.

☐ Check Your Progress – 2 :

1. The Forex regulations in India are taken care by
 - (a) Reserve Bank of India
 - (b) Nationalized Banks
 - (c) IATA
 - (d) Travel Agents
2. The Visa for a particular country is issued in India by
 - (a) Ministry of External Affairs
 - (b) Consulate of the country
 - (c) Airports
3. ECR clearance in Indian passports is required from the
 - (a) Ministry of Aviation
 - (b) Ministry of Defence
 - (c) Protector of Emigrants
4. A Passenger given privileges during Check In is called
 - (a) Priority Check In
 - (b) Premium Check In
 - (c) In Town Check In
 - (d) Privileged Check In
5. The acronym PNR stands for
 - (a) Passenger Name Record
 - (b) Passenger Not required
 - (c) Passenger Name Rack
 - (d) Passenger Name Register

3.9 LET US SUM UP :

Airline ticket is a proof of journey for a passenger on a flight as mentioned. An airline ticket may be issued by an airline or a travel agency. Understanding the various types of tickets, an airline issues are very important for fare construction. The electronic tickets are in vogue in the modern times and are processed by the computerized reservation system. The unit also familiarizes you with the ways an Electronic Ticket can be purchased and the advantages and the disadvantages of using different types of ticket. The unit also highlights the different check in procedures that are to be done by a passenger having a valid ticket. The unit also familiarizes you to, some of the documents that are required for an International travel.

3.10 ANSWERS TO CHECK YOUR PROGRESS :

☐ Check Your Progress 1 :

1. None of the Options
2. Mentioned on an E Ticket
3. 1st June 2008
4. The IATA Logo

☐ Check Your Progress 2 :

1. Reserve Bank of India
2. Consulate of the Country
3. Protector of Emigrants
4. Premium Check In
5. Passenger Name Record

3.11 GLOSSARY :

- MCO** : Miscellaneous Charges Order
BSP : Billing and Settlement Plan
E-Ticket : Electronic Ticket
PNR : Passenger Name Record
MRZ : Machine Readable Passport Zone
ECR : Emigration Check Required
ECNR : Emigration Check Not Required
-

3.12 ASSIGNMENT :

❖ **Define the under mentioned terms :**

Term	Explanation
IATA Neutral Paper Ticket	
Billing and Settlement Plan (BSP)	
Control Coupon	
Passenger Name Record (PNR)	
In Town Check In	
Code Sharing	

❖ **State True or False for the under mentioned statements :**

Statement	True/False
Additional facilities offered to passengers of First Class passengers during Check in is called Premium Check In	
PNR is a database for Computer Reservation System	
Any person can use an E ticket booked over internet	
Agent coupon was the second sheet of the Paper ticket used by the travel agent for his reference	

3.13 ACTIVITIES :

Download images of different sample E Tickets from the internet and study each component of the E Ticket.

Study about different types of passports issued by different countries and relate to differences with an Indian Passport.

Study how different countries do stamping of visas on Passports.

Study about major types of visas issued by at least 5 countries.

3.14 CASE STUDY :

Mr. Gupta was transferred to a new city and the company he was working for sent him a flight ticket as a part of relocation to his new destination of work. Mr. Gupta packed all his goods that were supposed to be carried by him and went to the airport. Once he entered the airport and headed towards the check in

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counter, an executive of the airline instructed him to undertake a web check in as was mandatory for travel. Mr. Gupta was confused as he never knew anything of the same. He approached the executive who told him about the procedure. With failed attempts to do the same he approached the executive who helped him to do the same. At the baggage drop Mr. Gupta was having an excess of 10 kg in the baggage. He was told to pay for the same by the executive of the airline. Mr. Gupta was again unaware of the baggage allowance of the aircraft and had to pay a hefty sum for his excess baggage.

1. How do you do a Web Check in procedure for any airline ?
2. To retrieve a booking done on any airline what number should be entered ?
3. Do all aircrafts have the same baggage norms ? If no elucidate on baggage norms from 2 airlines from your country in both domestic and international sector ?
4. Had Mr. Gupta saw his ticket as sent to him and read it carefully what information would he have been aware of prior to his departure ?

3.15 FURTHER READING :

Haag, Steven. Management Information system for the Information Age. Canada. Mc Graw Hill Ryersonson Ltd. 2009

E-Ticketing-IATA; <https://www.iata.org>

The Past, Present and Future of Airline Tickets; www.youtube.com

Difference in E Ticket and Paper ticket; The Tourism School; www.youtube.com

How to use an Airline E Ticket; Howcast; www.youtube.com

E-Tickets – Air India; <https://www.airindia.in>



UNIT STRUCTURE

- 4.0 Learning Objectives**
- 4.1 Introduction**
- 4.2 Payment Procedure and Transaction between Travel Agents and Airlines**
- 4.3 Benefits of Billing and Settlement Plan**
- 4.4 Modes of Payment by Passengers**
 - 4.4.1 Cash**
 - 4.4.2 Cheque**
 - 4.4.3 Credit Card**
 - 4.4.4 Debit Card**
 - 4.4.5 ACH Debit Card**
 - 4.4.6 Bank Transfers**
 - 4.4.7 Digital Wallets**
 - 4.4.8 Mobile Payments**
 - 4.4.9 Unified Payment Interface (UPI)**
 - 4.4.10 Equated Monthly Instalments**
 - 4.4.11 Card Point Redemption**
 - 4.4.12 Frequent Flyer Programs**
- 4.5 Refund Procedures**
 - 4.5.1 Refund for Itinerary cancellation**
 - 4.5.2 Refund for No Show**
 - 4.5.3 Refund for cancellation of flight by airline**
 - 4.5.4 Validity of an airline ticket**
- 4.6 Let Us Sum Up**
- 4.7 Answers to Check Your Progress**
- 4.8 Glossary**
- 4.9 Assignment**
- 4.10 Activities**
- 4.11 Case Study**
- 4.12 Further Reading**

4.0 LEARNING OBJECTIVES :

- To explain and understand the procedure of payment between travel agent and airlines.
- To list and understand the methods of payment that is accepted in booking a flight ticket.

- To explain the refund policies and procedures involved in a flight ticket for a passenger.

4.1 INTRODUCTION :

There are various payment procedures to settle financial transactions through the transfer of monetary value. The traditional instrument for payment was cash. With the advent of technology payment systems have been devised that are used in lieu of cash in various transactions undertaken either domestic or International. Payment systems may be physical or electronic and each has its own procedures, standards and protocols. Standardization has allowed some of these systems and networks to grow to a global scale, but there are still many country-specific and product-specific systems. With Global Distribution System allowing the traveller to access real time data, payment systems too have elevated to technology driven realms. Multiple payment solutions customized and made easy for the traveller are available over websites. Payment systems today must be highly secure, offer a great customer experience and work seamlessly across multiple sales channels. These payment systems have to meet high consumer expectations, comply with strict regulatory requirements and deliver operational efficiencies. In-flight systems have to cope with many specific environmental requirements and higher safety standards not faced by traditional retail merchants.

4.2 PAYMENT PROCEDURE AND TRANSACTION BETWEEN TRAVEL AGENTS AND AIRLINES :

It was a very cumbersome process by airlines to track thousands of travel agents and find the sales undertaken by them tally and exchange the required outstanding amounts. Modern day technology uses a method called the BILLING AND SETTLEMENT PLAN (BSP) that undertakes all the processes seamlessly. A BSP is a system designed to facilitate and simplify selling, reporting, remittance procedures of all IATA accredited travel agents and airlines electronically. BSP acts as a central body that consolidates all information and makes communication channel much easier instead of each travel agent coordinating with individual airlines making the communication process complex.

The Worldwide system has operations in 180 countries with around 88 BSPs and serves 370 participating airlines with on time settlement at a success rate of more than 99%. In 2017, IATA's BSP processed more than 236.3 billion USD. Normally a BSP is located one per country to facilitate the processing. In the United States of America, the travel agents have to be accredited by the Airlines Reporting Corporation (ARC) for processing of payments. The ARC is a company that provides ticket transaction and settlement services between Airlines and travel agents (both manual and online) and travel management companies that sell their products in the United States.

4.3 BENEFITS OF BILLING AND SETTLEMENT PLAN (BSP) :

There are several benefits of Billing and Settlement plan. To enumerate they are

- (a) The airlines receive one settlement from the BSP covering all the travel agents.
- (b) The travel agents issue one sales report and remit a single amount to a central processing unit.

- (c) The cross checking, a very tedious process is done by the system and there is no involvement of the airline in the process.
- (d) The sales for the agents are all reported electronically.
- (e) A lot of savings is undertaken by airlines in terms of resources for billing and collection.
- (f) The distribution of billing reports and generation of debit/credit memos are processed electronically through a BSP link.
- (g) The process of centralization of the payments leads to effective checks and balances and control.
- (h) The flow of documents is consolidated and there is scope of continuous process monitoring, quality control and checks at every step.

Simple step by step elucidation of BSP operations :

Step 1 : Customer requires Air Transportation service and contacts travel agent.

Step 2 : Travel agent offers advice, choice of flights and corresponding fares. Customer makes a decision for purchase of the service.

Step 3 : Travel agent makes reservation through Global Distribution System and issues ticket to the customer.

Step 4 : The ticket details are automatically sent to the Data Processing Centre of the BSP.

Step 5 : The Data Processing Centre processes the information to produce a billing report of the tickets sold by the agent for each BSP participating airline and generates reports.

The Data Processing Centre of BSP produces one sales report the Airline Billing Analysis for each participating airline detailing sales issued by all IATA accredited agents. It also produces an Agent Billing Analysis detailing each transaction issued by the agent for all BSP participating airlines.

4.4 MODES OF PAYMENTS BY PASSENGERS :

The methods of payment in the digital era have taken a next generation leap. The traditional instruments of payment have given way to modern payment options online for customers. The methods of payment are specific to different organizations and acceptance of payments through various mode are prerogatives of the organizations. Payment systems today must be highly secure, offer a great customer experience and work seamlessly across multiple sales channels. These payment systems have to meet high consumer expectations, comply with strict regulatory requirements and deliver operational efficiencies. The majority of payment systems today rely on online communications for authorisation, verification, authentication and funds transfer and airline companies and travel agents have to ensure high end security for a hassle free experience.

The various methods of payment the customers undertake may vary from country to country and be organization specific. Some of the most common methods of payment are :

4.4.1 Cash Payment :

With the advent of the digital era and majority of bookings for airlines happening online, this payment is still undertaken by customers who purchase

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airline tickets from offices of the travel agents or over the airline counter. Though, not much in use but still it is one of the most popular modes of payment. The mode is safe for customers as chances of online frauds are minimal and is absolutely hassle free.

4.4.2 Cheques :

Another commonly used mode of payment is cheque. A cheque can be defined as an order to a bank to pay the stated amount of money on the cheque from a person's account to the person/organization whose name is mentioned on the cheque. The cheque is considered one of the safest mode of payment as one does not have to carry a large sum of money all around. A cheque book is given to a person when he opens an account in a bank. Many organizations that do round the year transactions, with travel agents, for purpose of booking airline tickets pay by cheque to the travel agent. However, the method cannot be undertaken for online purchase or over the counter retail purchase of airline tickets.

4.4.3 Credit Card :

Credit cards are the most common medium of payment online. Credit cards are issued by financial institutions. Credit cards give customers a pre-set credit limit which can be used to pay for the purchases. The credit limit of the card is decided by the financial institution depending on the customer's credit score and monthly income. A vast majority of businesses let the customer make purchases with credit cards, which remain one of today's most popular payment methodologies for buying consumer goods and services. Most major credit cards, which include Visa, MasterCard, Discover, and American Express, are issued by banks, credit unions, or other financial institutions. Many credit cards attract customers by offering incentives such as airline miles, hotel room rentals, gift certificates to major retailers and cash back on purchases.

4.4.4 Debit Card :

Debit cards are linked to an account and, in most cases, are only offered in combination with a current or savings account provided by a bank. A debit card number is 13 to 19 digits long and is printed on the front of the card along with the dates of the card's validity. The debit cards three-digit security number (CVV code) is usually on the back of the card, in or near the signature strip. The money is immediately debited from the linked account of the bank once a payment is made through a security pin entered by the customer or a one time pin generated and entered by the customer.

4.4.5 ACH/Direct Debit :

ACH, Direct Debit, E-check and others are a form of EFT (electronic funds transfers) and a means of collecting payment from a customer by pulling the funds directly from their bank account and transferring it to the merchant's account. It is referred to by different names in different countries, for example, in the United States it may be referred to as ACH and in the United Kingdom it is called direct debit.

4.4.6 Bank Transfers :

Customers enrolled in an internet banking facility can do a bank transfer to pay for online purchases. A bank transfer assures customers that their funds are safely used, since each transaction needs to be authenticated and approved first by the customer's internet banking credentials before a purchase happens.

4.4.7 Digital Wallets :

A digital wallet is an online stored value service where funds are preloaded and made available, using the provider's online services. Popular providers include Skrill, NETELLER, Pay Pal. A digital wallet also known as "e-Wallet" refers to an electronic device, online service, or software program that allows one party to make electronic transactions with another party bartering digital currency units for goods and services. Consumers also benefit when using digital wallets because their information is encrypted or protected by a private software code; merchants benefit by receiving a combination of protection against fraud, faster receipt of payment, decreased transaction costs, and decreased theft loss. Popular wallets in India are Mobikwik, JioMoney, Oxigen, Vodafone mPesa etc

4.4.8 Mobile Payments :

Mobile payment is a new and rapidly adopted alternative payment method – especially in Asia and Europe. Instead of paying with cash, check or credit cards, a consumer can use a mobile phone to pay for wide range of services and goods. The charges are then added to their phone bill. There are primary models for mobile payments :

- Mobile wallets
- QR Code based payments
- Card-based payments
- Carrier billing (Premium SMS or direct carrier billing)
- Contactless payments NFC (Near Field Communication)
- Direct transfers between payer and payee bank accounts in near real-time (bank-led model, intra/inter-bank transfers/payments that are both bank and mobile operator agnostic)

Financial institutions and credit card companies as well as Internet companies such as Google and a number of mobile communication companies, such as mobile network operators and major telecommunications infrastructure such as Airtel from Orange and smart phone multinationals such as Ericsson and BlackBerry have implemented mobile payment solutions. Google Pay is an example of Mobile wallet.

4.4.9 Unified Payments Interface (UPI) based payment :

Unified Payments Interface (UPI) merges several accounts into a single platform that has all the security features embedded. A payment for example initiated by a customer on BHIM app would request the bank that has been registered on the BHIM app by the customer. The customer would have to verify all the security aspects in the BHIM app and the payment would be transferred from the account of the customer to the account where the customer is making the payment.

The benefits for UPI based payment for customers are :

- Round the clock availability
- Single Application for accessing different bank accounts
- Use of Virtual ID is more secure,
- No credential sharing and Single click authentication
- Raising Complaints from Mobile App directly

4.4.10 Equated Monthly Instalments (EMI) :

Many banks and financial institutions equate the payment to be paid by a customer into instalments of three or six or nine months depending on the need of the customer. The customer can avail the benefit at a charge and pay the amount spent for an airline ticket over a span of few months. The financial Institution charge a particular amount of interest on the same. Airline companies majorly give this benefit to credit card users where banks and credit card companies undertake an agreement to extend such a benefit to the customer. It is completely the prerogative of the airline company or online travel agents to extend the benefit or not. The process is normally not followed by a travel agent having a physical space.

4.4.11 Card Point Redemption :

Flight tickets can be purchased by redeeming the points accrued on Credit or Debit cards. The Bank's Reward Points can be redeemed for all Domestic & International Airline Tickets. There are options during payment where the customer needs to click and enter details to redeem points. Customer also has the option to redeem only a particular number of points and pay the balance amount by any other mode of payment like Credit – Debit Card, Online Banking, Wallets, EMI or UPI. Redemption of points is very site specific and is generally offered by Online Travel Agents who have agreements with various banks and agencies to undertake such initiatives.

4.4.12 Frequent Flyer Programs :

A frequent flyer program is a loyalty program offered by any airline where customers enrolled in the program accumulate points during their travel. Points earned may depend on the class of travel, the distance travelled by customer or the amount of money paid for the ticket. These accumulated points have a particular value as decided by the airline and they can be redeemed as a method of payment during the travel by the customer. Many airlines have entered into agreements with various banks and cobranded for a customized credit or debit card which also allows for accumulation of points but on the money spent for the ticket.

4.5 REFUND PROCEDURES :

The refund of flight tickets are governed by the rules of airlines laid down specifically. After a booking is done for an electronic ticket and the ticket is issued by the airline, a set of mandatory rules and regulations pertaining to refund process for the particular airline along with other norms and regulations are sent to the customer along with the ticket. The rules for refund are as

4.5.1 Refund on Itinerary Cancellation :

On payment of a specific cancellation charge as applicable by the airline any ticket can be cancelled online by a customer for a particular itinerary. The cancellation of the tickets normally have to be done 2 hours prior to the departure time of an domestic flight and 4 hours prior to the departure time of an International flight. The credit of the refund amount generally takes 7 to 10 working days. Refunds in cash are only made for domestic travel at the airport counters or are undertaken as per the policy of the airline. Tickets that are booked through a travel agency and cancelled; the refund is processed to the particular travel agency. A lot of airline carriers have made a policy to charge a zero

cancellation fee from customers, by charging a required amount from the customer during the ticket booking process. Refund procedures for tickets that are issued out of the airline's country of registration are processed in the country where the ticket is purchased from. There are certain special fares charged by airlines, where refund is non-applicable to passengers. Airlines and Travel agents do specify before the purchase about these tickets.

4.5.2 Refund for No Show :

There may be situations where a passenger may not be able to travel due to some exigency and is not able to cancel the ticket or he may have missed the flight. In case of a missed flights/ no show, all statutory taxes and User Development Fee (UDF)/Airport Development Fee (ADF)/ Passenger Service Fee (PSF)/Airport Security Fee (ASF) will be refunded wherever applicable.

4.5.3 Refund for Cancellation of flight by Airline :

In event of a particular flight being cancelled by any aircraft, alternative arrangements are undertaken and notified to the passenger. Full refunds of the amounts are processed in case the passenger is not comfortable with alternative arrangements. If the ticket has multiple travels and flight for a particular part of the travel is cancelled, the refund is processed for the particular sector.

4.5.4 Validity of Airline Ticket :

All air tickets have a validity period recorded as per the rules laid down by the airline. The validity is typically for a year in advance of the date it was booked, after which the ticket stands void. Tickets are valid for travel only when used in accordance with all terms and conditions of sale include but are not limited to :

- The Passenger's itinerary, as stated on the ticket or in passenger's reservation record.
- Any requirement that the passenger stay over a specified date or length of time at the destination specified on the ticket.
- Any special purpose or status (for example senior citizen, military personnel etc) that entitles passenger to a special or reduced rate.
- Any other requirement associated with the passenger's fare level.

A ticket is also considered invalid if :

- It is used for travel to a destination other than that specified on a ticket.
- The passenger failing to comply with applicable stay over requirements.
- The passenger does not meet the purpose or status requirement associated with the fare category on the ticket.
- The ticket is purchased and used in a manner to avoid applicable fare rules.

☐ Check Your Progress – 1 :

1. An E Ticket is cancelled and refund processed
 - (a) Over the Counter by cash (b) At the Travel Agent by cash
 - (c) Online to account from which the ticket was booked.

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2. For a Billing and Settlement Plan (BSP)
 - (a) The airlines receive one settlement from the BSP covering all the travel agents
 - (b) The airlines receive settlements from travel agents individually.
 - (c) Travel agents form a consortium to settle the amount to airlines.
3. Credit Cards used for payment of airline ticket online have
 - (a) Pre-set Credit limit
 - (b) No Credit Limit
 - (c) Unlimited Spending limit for tickets
4. Unified Payments Interface (UPI) is a system that powers
 - (a) Single bank account to a single mobile application
 - (b) Multiple bank accounts into a single mobile application
 - (c) Links the Credit Card to the Bank account for payment
5. Points earned by travellers during travel and used for payment are called
 - (a) Low Points
 - (b) Loyalty Points
 - (c) Travel Miles
6. A validity of an airline ticket is generally for
 - (a) 6 Months
 - (b) 9 months
 - (c) 12 Months
 - (d) 18 Months
7. Frequent Flyer Program of an airline is a
 - (a) Loyalty program initiated by the airlines
 - (b) Loyalty program of a bank
 - (c) Program for flyers flying for the first time
 - (d) None of the above
8. QR code based payments are part of
 - (a) Cash Payment
 - (b) Card Payment
 - (c) ECS Payment
 - (d) Mobile Payment

4.6 LET US SUM UP :

Payment for an airline ticket is one of the most essential steps in the entire process. With the evolution of technology, payment methods have drastically changed. The traditional cash transactions are obsolete over the internet and cashless transactions with multiple options are in practice. The unit connects you with the various methods of transactions that a customer does in purchasing a flight ticket. It is also important for you to know how exchange of remittances happen between the travel agent and the airlines.

4.7 ANSWERS TO CHECK YOUR PROGRESS :

1. Online to account from which the ticket was booked.
2. The airlines receive one settlement from the BSP covering all the travel agents
3. Pre-set Credit limit
4. Multiple bank accounts into a single mobile application
5. Loyalty Points

6. 12 Months
7. Loyalty program initiated by the airlines
8. Mobile Payment

4.8 GLOSSARY :

- USD :** United States Dollar
ARC : Airlines Reporting Corporation
ASF : Airport Security Fee
CVV Code : Card Verification Value Code
NFC : Near Field Communication
UPI : Unified Payment Interface
EMI : Equated Monthly Instalments
ADI : Airport Development Fee
UDF : User Development Fee
PSF : Passenger Service Fee
QR Code : Quick Response Code

4.9 ASSIGNMENT :

❖ **State True or False :**

Statement	True/False
BSP is a transaction done between the passenger and airlines	
Cash payments can be done over the Internet for an airline ticket	
Credit limit of a Credit card is decided by the financial institution	
Debit cards are linked to bank accounts of the card holder	
Information of users of digital wallet are encrypted	
EMI's are offered by airlines directly to passengers booking a ticket	
Credit Card points can be redeemed to book an airline ticket	
Airline tickets purchased have to be cancelled at least 2 hours before the departure time	
If an airline ticket is used for travel to another destination than specified, it is considered to be invalid	
Any person is eligible to travel on a ticket booked by a travel agent	

4.10 ACTIVITIES :

List and note down Frequent Flyer Programs of 10 major airlines of the world.

Study the role of Master, VISA, Maestro, on a Debit/ Credit Card.

List some Mobile Transfer QR Code based applications working in India.

Study on BHIM application and list the role of BHIM application.

4.11 CASE STUDY :

Mr. Jain booked a ticket for Hyderabad from Mumbai from a travel agent for his official trip. Due to a last minute exigency he had to cancel his ticket. He called up the travel agent and asked him to cancel his booking. The travel agent said that the booking can be cancelled but he would get no refund of the same as the stipulated time for cancellation of the ticket was over.

1. What is the time limit provided by airlines to cancel a ticket ?
2. If a ticket is booked by a travel agent and the passenger cancels the ticket how is the refund processed ?
3. In the above case what should the travel agent do to get a certain part of the amount back in the ticket ?

4.12 FURTHER READING :

Payment Methods and surcharges explained–AirFrance; <https://www.airfrance.in>

Payment Options–Lufthansa; <https://www.lufthansa.com>

Payment Methods, Modes of payment–Indigo;<https://www.goindigo.in>

Billing and Settlement Plan–IATA; <https://www.iata.org>

BLOCK SUMMARY :

In this block you have been introduced to the various booking codes that airlines use for ticketing purpose. An airline cabin is divided into various class and seats are allocated to the class. Each seat in a class has a distinct fare and the same is denoted through booking codes. You have also learnt about codes that are designated next to the fare basis to indicate the feature of an airline ticket. The Passenger type codes indicate the characteristic of a passenger travelling by an airline. These characteristics are often linked to the airfare charged for a particular category of passenger. You have also learnt about the different types of airfare and the basic terms related to the fare formula that will help you in fare construction. The airline ticketing uses a Neutral Unit of Construction (NUC), a fictitious currency, for calculation of airfare. Every country on the globe has a different currency and value. To standardize, fare calculations in air ticketing use a neutral currency and conversions from local currency to NUC is done through the IATA Rate of Exchange, which has been vividly explained to you in the block.

The block also has emphasized on the various types of air ticket that was in use and modern day Electronic Ticket that is in use. You have learnt about the advantages and the limitations of both. To travel across the globe there are other documents that are essential and stipulated by the government of every country. The same has been explained to you in the block. The purchase of airline tickets requires payment to be undertaken. The block highlights in detail the payment modes and processes that take place between a travel agent and an airline related to payments and also by customers in purchasing an airline ticket. The entire block is important as it builds a foundation for different aspects of air ticketing.

BLOCK ASSIGNMENT :

1. Explain the documents required for International Air travel with relevant examples ?
2. What is Billing and Settlement Plan ? List the benefits of Billing and Settlement Plan ?
3. List and explain 5 modes of online payment used for purchase of Airline Ticket over the internet ?
4. List 10 Passenger codes and explain the relevant interpretation of each code ?
5. Write a detailed note on Rounding Off procedure in Airfare calculation ?
6. What is a Manual Paper Ticket ? Elucidate on the different coupons being used in a manual paper ticket ?
7. Explain the different types of airfare with relevant examples ?
8. What is an Electronic Ticket ? List advantages and disadvantages of an Electronic ticket ?

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ISBN 978-81-949223-5-3

Edition : 2020

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The content is developed by taking reference of online and print publications that are mentioned in Bibliography. The content developed represents the breadth of research excellence in this multidisciplinary academic field. Some of the information, illustrations and examples are taken “as is” and as available in the references mentioned in Bibliography for academic purpose and better understanding by learner.’

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!

COMPUTER RESERVATION SYSTEM

Contents

BLOCK 4 : COMPUTER RESERVATION SYSTEM (CRS)

Unit 1 Background of Computer Reservation System (CRS)

Introduction, Objectives of Computer Reservation System, History of Computer Reservation System, Major Airline Computerized Reservation System

Unit 2 Global Distribution System

Introduction, Emergence of Global Distribution System, Benefits of Global Distribution Systems, Major Global Distribution Systems of the World, Amadeus, Sabre, Galileo International, Worldspan

Unit 3 Passenger Air Tariff

Introduction, Building Fare Calculation, Equivalent Fare Paid, Constructing Fare Calculation by using NUC, Intermediate Points, Surface Sectors, Determining Global Indicators and Fare Construction, Fare Construction, Fare Calculation for Return Journeys, Fare Calculation for Round the World Journey



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Computer Reservation System

BLOCK 4 : COMPUTER RESERVATION SYSTEM (CRS)

UNIT 1 BACKGROUND OF COMPUTER RESERVATION SYSTEM
 (CRS)

UNIT 2 GLOBAL DISTRIBUTION SYSTEM

UNIT 3 PASSENGER AIR TARIFF

COMPUTER RESERVATION SYSTEM (CRS)

Block Introduction :

The block introduces you to the Computerized Reservation Systems and every aspect related to it. The block reflects on the storage and use of information through the computer for conducting all transactions pertaining to air travel. The Computer Reservation Systems were initially designed by airlines and their alliances and partnerships. However, with the advent of Global distribution systems, the computer reservation systems were outsourced to these Global Distribution system companies who managed the airline ticketing. The GDS systems allow users through the internet gateways to book not only airline tickets but services such as hotel rooms, car rentals, holiday packages, cruise tickets, rail tickets, bus reservations and other services. The block gives an insight into the evolution of Computer Reservation Systems and the dynamic transition of airlines from the manual ticketing system to the CRS. The block also provides valuable input on Global Distribution Systems (GDS), a computerised network system. These GDS systems are either owned or operated by a specific organization that enables all types of transactions between service providers and customers. The use of real time inventory from a vendors system and aligning it to the need of the customer by linking to the vendors system is the prime focus of GDS. The block provides the history and the growth of world famous GDS systems like Amadeus, Galileo, SABRE, Worldspan and Travelport in its units.

The final unit in the block highlights fare calculation from the basics in a tutorial mode with several examples to understand and reiterate learning. The unit is important for you to undertake manual fare calculations of different itineraries. Though fare calculations are undertaken through a system interface and commands are to be understood for the system, however, the knowledge of the components and the procedures are equally important and the unit focuses on the basics to make learning simple and understandable.

Block Objectives :

- To understand the evolution, history and list airlines using the Computerized Reservation System.
- To enumerate the emergence of Global Distribution Systems and explain the key GDS of the world.
- To understand fare calculation methods and techniques through different itineraries and determining factors.

Block Structure :

Unit 1 : Background of Computer Reservation System (CRS)

Unit 2 : Global Distribution System

Unit 3 : Passenger Air Tariff

UNIT STRUCTURE

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 Objectives of Computer Reservation System
- 1.3 History of Computer Reservation System
- 1.4 Major Airline Computerized Reservation System
- 1.5 Let us Sum up
- 1.6 Answers to Check Your Progress
- 1.7 Glossary
- 1.8 Assignment
- 1.9 Activities
- 1.10 Case Study
- 1.11 Further Reading

1.0 LEARNING OBJECTIVES :

- To understand the evolution of Computerized Reservation System.
- To enumerate the history of Computerized Reservation System.
- To list the major airline Computerized Reservation System.

1.1 INTRODUCTION :

Computer Reservation System (CRS) is a revolutionary innovation in the field of travel that use computerized systems for undertaking transactions, storage and retrieval of data, generating reports, planning and forecasting business and MIS. The CRS was originally designed and operated by airlines and later Global Distribution System companies used the same for ticketing purpose in airlines. In early days of commercial aviation, passengers were relatively less and the fares for each route of each airline in the United States were tightly regulated by the Civil Aviation Aeronautics board after 1940. These fares were published in a volume entitled the Official Airline Guide (OAG), from which travel agents and passengers could construct an itinerary and calculate. These were further sent through Telex or call to the airline agents who used to mark the reservation on a card and file it. The demand for air travel, however, made the process obsolete.

1.2 OBJECTIVES OF COMPUTER RESERVATION SYSTEM (CRS) :

The objectives of Computer Reservation System (CRS) can be enumerated as

- (a) CRS is a one stop service stop for travellers, travel agents, airlines and other stake holders that make travel easy and synchronized.

Computer Reservation System

- (b) CRS eliminates the physical and geographical distance between mediators and consumers over a digital platform.
- (c) CRS provides real time information about the availability of seats on various airlines to different destinations and provides universal coverage.
- (d) CRS is user friendly and easy to use. It provides an active interface between the user and the airline company.
- (e) CRS provides online payment integration for the fares for different carriers.
- (f) CRS comprehensively works on Data Management, Email notification and other notifications, accounting processes, cancellation and refund procedures, pricing management, customer management, pricing management and customization of lot of services.
- (g) CRS is beneficial to both Business to Business models and Business to Customer models.

1.3 HISTORY OF COMPUTER RESERVATION SYSTEM (CRS) :

In 1946 the first automated booking system was installed by the American Airlines in the United States of America on an experimental basis. The machine was called the Electromechanical Reservoir. Soon the machine was replaced by the Magnetronic Reservoir with a temporary storage based on the Magnetic drum. The system was fairly successful and was soon used by a number of airlines and even hotels and other companies like Goodyear for managing inventories. The system failed because the same required a lot of human intervention where Travel agent needed to call the Booking Office whose team would make the requests to a team handling the Reservoir machine. The results would again be communicated back through the same channel. There was no direct interaction between the travel agents and the team handling the Reservoir machine leading to a lot of time getting consumed and communication.

Hitachi designed the first Train seat ticket Reservation system in Japan (1950) for its Japanese National Railways, named MARS 1. The entire system was controlled by a transistor computer with a Computer Processing Unit and magnetic drum memory of 4,00,000 bits.

The concept of remote access of a computer system was experimented in 1953 by Trans Canada Airlines (TCA). The first test was conducted at the University of Toronto's Manchester Mark 1 machine. The tube based system had an input and output was a major problem during the series of experiments. The unreliable tube based system was rejected and with the Ferranti Canada getting involved in the project, the entire project was shifted to a new system of punch cards and transistorized system. The result of the research was Reservec, a computerized reservation system founded in 1962. Booking through Reservec started in 1963 and machines were installed in Trans Canada Airlines offices.

In 1953, American Airlines CEO, C.R. Smith happened to sit next to R. Blair Smith, a senior IBM sales representative. Their discussion on the idea of an automated Airline Reservation System (ARS) resulted in collaboration between American Airlines and IBM in 1959 leading to a venture known as Semi Automatic Business Research Environment (SABRE). By 1964 SABRE became the largest civil data processing system in the world. Soon other airlines too established their own systems. In 1964, Pan American World Airways (PANAM) launched their system the PANAMAC. In 1968, Delta Airlines from United States

launched its computerized system DATAS (Delta Automated Travel Account System).

In 1971, United Airlines and Transworld Airlines launched the Apollo Reservation System and Programmed Airline Reservation System (PARS). By 1976, United Airlines started offering to travel agents. This prevented travel agents to book tickets for United's competitors. Soon PARS, SABRE and DATAS were also released to travel agents. In 1978, the government of United States lifted restriction on fares, route, coverage and market entry. Airlines could fly to any destinations with flexibility in airfares. The demand for real time airfares started with the deregulation and ticket distribution for airlines moved from the airline offices to travel agencies. Computer Reservation System became essential for Travel agents and the market soon turned lucrative for Computer Reservation Systems like SABRE and Apollo. After the deregulation, Texas Air Executive, Frank Lorenzo purchased the loss making Eastern Airlines specifically to gain the control of its Computer Reservation System System One.

European Airliners also started investing in the field of Computer Reservation System and in the 1980's the demand and technological advancement led to lot of development in the sector. In 1976, Vide Com International tied with British Airways and launched TRAVICOM the world's first multi-access Computer Reservation System. Travicom was distributed to thousands of travel agents in the United Kingdom. The system used a common distribution language as a communication medium between the travel agent and the airline. The same multi-access system was also replicated in the United States by Videcom. In 1984, Apollo Travel Services became an independent affiliate of United Airlines and was rebranded as COVIA. In 1987, two airline companies Air France and Lufthansa entered into an agreement and on the model of System One developed their Computer Reservation System AMADEUS. In 1990, Delta Airlines, North West Airlines and Transworld Airlines formed WORLDSPAN. In 1993, a consortium of British Airways, KLM and United Airlines and others formed a competing company Galileo International. The company was formed using United Airlines Apollo network. In 1987, COVIA had sold 50% of its stakes to group of European Airliner to form the global Galileo partnership. In 1997, Galileo International was listed on New York stock exchange and had purchased the Apollo Reservation System designed by United Airlines in 1976. In 2001, Galileo was acquired by Cendant Corporation and in 2006, Cendant Corporation sold Orbitz and Galileo forming Travelport. Travelport acquired Worldspan in 2007 and the merged companies controlled a market share of around 46%.

The Galileo Central Reservations system is one of the key Computer Reservation System used by the travel industry. Galileo was created to replace the existing multi-access systems, where the travel agent had to undertake the task of switching between the reservations systems of many different airlines to complete an itinerary. Galileo and other similar systems held information of most airlines in a single database and allowed a single booking record to be created. These types of systems were called Global Distribution Systems or GDS. With the advent of the internet, the travel market place has become a global arena where millions of buyers sellers work together to exchange travel services. The Global Distribution Systems have become electronic superstores for travellers and travel is one of the most sold consumer product over the internet. Statistics reveal that global online travel sales in United States alone were 168 billion dollars and Internet users who managed travel sales online were around 64 million in 2016.

Computer Reservation System

The discussion on internet as a distribution channel for travel needs starts with an understanding of the distribution infrastructure and the Global Distribution System. In the following units you shall be acquainted with the role of Global Distribution Systems and their impact on the travel industry.

1.4 MAJOR AIRLINE COMPUTERIZED RESERVATION SYSTEMS (CRS) :

CRS	Explanation
Aircore	Created by Unisys, it is a GDS and PSS system used by many airlines
Amelia RES	Created by Intellisys Aviation Systems and is used by around 40 Airlines
Abacus	This system was purchased by SABRE in 2015 and is used by many airlines including Air India
ACCELaero	Created by Information Systems Associates, the system is used by 14 airlines
Amadeus	The system is been used by around 440 airlines, 90000 travel agencies in 195 countries and a lot of online travel agencies like Expedia, yatra.com etc.
SABRE	Created by American Airlines, the system is used by over 400 airlines, hotels, car rentals, rail carriers and online travel agencies like Travelocity, Priceline etc
Travelport which includes Apollo, Galileo and Worldspan	The system is used by a large number of airlines, hotels, car rental companies and online travel agents.
Others	Travel Sky, Travel Technology Interactive, Takeflite, Sell more seats, Radixx, Skyvantage, Patheo , PARS, Mercerator etc.

☐ Check Your Progress – 1 :

- The fares for different routes in olden days were published in a volume for fare construction known as
 - Official Airline Manual
 - Official Airline Guide
 - IATA guide
- The Computer System used for booking on Trans Canada Airlines was
 - RESERVED
 - RESERVE
 - RESERVEC
 - RESERVET
- In 2001, Galileo was acquired by
 - Orbitz
 - Travelport
 - COVIA
 - Cendant Corporation
- In 1968, Delta Airlines launched its own Computer System called
 - DATAS
 - DATA
 - DELTA
 - DELTAS
- The restriction on fare , route and coverage for airlines was lifted by United States government in
 - 1976
 - 1977
 - 1978
 - 1979

6. The first automated Booking system by American Airlines was called
(a) Electrothermal Reservoir (b) Electromechanical Reservoir
(c) Magnetic Reservoir (d) Magnetronic Reservoir
7. The first CRS designed for train ticketing was called
(a) Apollo II (b) Mars II (c) Mars I (d) Apollo I
8. 5. United Airlines, TWA and Apollo Reservation system, in 1971 launched the CRS
(a) PARS (b) DATAS (c) SABRE (d) PANAMAC
9. In 1993, a consortium of British Airways, KLM and United Airlines launched a CRS
(a) Amadeus (b) SABRE (c) Galileo (d) Travicom
10. Travelport includes the following CRS
(a) Galileo, Sabre, Amadeus (b) Apollo, Galileo, Worldspan
(c) Worldspan, Apollo, Sabre (d) PARS, Galileo, Worldspan

1.5 LET US SUM UP :

Computer Reservation System (CRS) is a revolutionary innovation in the field of travel that use computerized systems for undertaking transactions, storage and retrieval of data, generating reports, planning and forecasting business and MIS. Modern day ticketing happens from global GDS systems to book and sell for multiple airlines. You might be opening any website and with a click of few buttons book a flight ticket. The journey to this transition was a long one and in this unit you shall be acquainting yourselves to the evolution of the modern systems.

1.6 ANSWERS TO CHECK YOUR PROGRESS :

1. Official Airlines Guide
2. RESERVEC
3. Cendant Corporation
4. DATAS
5. 1978
6. Electromechanical Reservoir
7. MARS I
8. PARS
9. Galileo
10. Apollo, Galileo, Worldspan

1.7 GLOSSARY :

CRS : Computer Reservation System
GDS : Global Distribution System
MIS : Management Information System
OAG : Official Airline Guide
TCA : Trans Canada Airlines

Computer Reservation System

SABRE : Semi Automatic Business Research Environment

PANAM : Pan American World Airways

DATAS : Delta Automated Travel Account System

PARS : Programmed Airline Reservation System

1.8 ASSIGNMENT :

❖ **Expand the following Acronyms :**

OAG	
CRS	
PARS	
DATAS	
PANAM	
SABRE	

1.9 ACTIVITIES :

Make a list of 10 top airlines of the world and write the Global Distribution Systems used by these airlines.

Refer to the websites of each Global Distribution Systems mentioned in the unit and list the other services offered by these companies in various sectors.

1.10 CASE STUDY :

Mr. Sunder was not well versed with the Internet. One day he had to book a flight ticket in emergency and tried booking over the website. He had been booking tickets through his travel agent all these years. As he progressed and browsed the internet sites slowly he found that there are lot of options to choose from and save money on his flight bookings which his travel agent never offers. He could analyse each airline, compare prices and save a lot of money. On booking his ticket successfully Mr. Sunder decided that he would try booking his own ticket henceforth over the internet.

1. What is the objective of online booking sites or airline booking sites related airline tickets ?
2. Elucidate on the key players who provide online CRS facility to booking sites over the internet ?

1.11 FURTHER READING :

<https://www.wikiwand.com>

<https://www.cbo.gov>

<https://www.travel-industry-blog.com>

<https://www.hotel-online.com>

<https://www.researchgate.net>; Airline Reservation Systems

The Industry's Consolidation; Computer Reservation System; Chapter 2



UNIT STRUCTURE

- 2.0 Learning Objectives
- 2.1 Introduction
- 2.2 Emergence of Global Distribution System
- 2.3 Benefits of Global Distribution Systems
- 2.4 Major Global Distribution Systems of the World
 - 2.4.1 Amadeus
 - 2.4.2 Sabre
 - 2.4.3 Galileo International
 - 2.4.4 Worldspan
- 2.5 Let Us Sum Up
- 2.6 Answers to Check Your Progress
- 2.7 Glossary
- 2.8 Assignment
- 2.9 Activities
- 2.10 Case Study
- 2.11 Further Reading

2.0 LEARNING OBJECTIVES :

- To enumerate the emergence of Global Distribution Systems
- To list the benefits of Global Distribution System
- To evaluate and explain the major Global Distribution System providers of the world.

2.1 INTRODUCTION :

The Computer Reservation System in the travel sector was a pioneer to digitizing the entire concept of travel. With technology the need for real time inventory emerged and with the emergence of the internet the reach of the real time inventory shifted to travellers who could now check and book tickets online. A paradigm shift was brought in by the Global Distribution System (GDS). The Global Distribution System is a network system that facilitates airlines, hotels, car rental companies and other service providers to enable transactions with travel agents and customers using a real time inventory over a computer.

2.2 EMERGENCE OF GLOBAL DISTRIBUTION SYSTEM (GDS) :

The Computer Reservation System that evolved posed some challenges that led to evolution of a platform that was easily accessible. The Computer Reservation system

Computer Reservation System

- (a) Had a long term contract with Computer Reservation System provider. There was a monthly subscription fees for hardware and software installation and training. The lowering of fees depended on more bookings.
- (b) Had no access to broad airline content with travel agencies restricted to one airline or a few. Other fees were charged to co-host different airlines on the same platform.
- (c) Co-hosting of competitor airlines was prohibited and more booking fees were charged with no advantage leading often to a monopolistic situation.

In 1984, the gaps in the Civil Aeronautics board were resolved and this paved the way for participation of Airline companies operating Computer Reservation System's in competitor Computer Reservation System. The compulsion of sharing service enhancement with other airlines participating in the Computerised Reservation System commenced and access to more than one system was permitted to travel agents. The contract terms of travel agents with CRS providers were also reduced to 3 years. With time the sharing of inventory started from one CRS provider to another. The Computerised Reservation Systems owned by airlines became public and independent. Major mergers, acquisitions started amongst airlines leading to formation of mega carrier conglomerates with routes spread across the globe. The emergence of the internet led to the development of software and websites leading to creation of Global Distribution systems.

The development of internet led to the growth of online commerce. The airline carriers developed websites and started approaching the customer directly, bypassing the Global Distribution System booking fees and pursued customers directly. The airline carriers gave direct access to schedules and discounted fares to the travellers on their websites. With emergence of Global Distribution System, there was advent of Third Party technology developers like Farelogix, G2 Switchworks, ITA Software and Travelfusion that offered travel agencies and carriers direct connect technologies that funnelled content directly from airline to agencies. These companies became known as Global New Entrants or GNE's.

The Global Distribution System market started falling in the Internet powered market environment. The Global Distribution System companies started diversifying their products and services. They started developing and supplying Information Technology tools, Technology and Infrastructure content for different airlines. The companies started investing in corporate airline booking tools. SABRE acquired Get There in 2000 and launched a corporate online travel agency Travelocity as an online competitor to corporate travel agency clients.

2.3 BENEFITS OF GLOBAL DISTRIBUTION SYSTEMS :

The benefits of a Global Distribution System led to a complete revolution in the world of travel and are manifold. They include

- (a) Connecting to the customers directly over a technology platform
- (b) Transparency of Pricing structure for various airlines operating in scheduled routes
- (c) Enabling retail travel agencies and online travel agent (OTA) business models to succeed.
- (d) Enabled travel agents to penetrate the travel market globally with their services which was physically impossible.
- (e) Enabled easy access to corporate clients over specially designed platforms.

- (f) Provided a real time status update of inventory and price dynamics.
- (g) Provides travel products from suppliers around the world in real time. The real time prices of the products and availability is also compared by the system.

2.4 MAJOR GLOBAL DISTRIBUTION SYSTEMS OF THE WORLD :

2.4.1 Amadeus :



"We are passionate in our pursuit of better technology that makes better journeys by connecting the entire travel ecosystem".

The mission of Amadeus very well justifies it to be the most popular and Global Distribution System company of the world in the travel sector. It's advanced computer reservation software and web service xml provides search facilities for travel products, allows booking and ticketing for travel agencies and travel providers. It also processes other services in real time. The company specializes in technology based solutions to manage airlines, rail services, cruise, car rentals hotel and travel bookings. The services are provided through AMADEUS computer reservation system distribution business area. The company also offers computer software solutions for Reservations, Inventory Management, Departure Control Systems, Revenue Management System and Passenger Service System. Amadeus is a global company with its presence in nearly 200 countries local commercial bodies. Amadeus is a member of IATA and employs around 19000 employees across the globe. The company was listed as "The World's Largest Public Companies by the Forbes list.

❖ History :

Amadeus was created as a neutral Global Distribution System through an alliance between Air France, Lufthansa, Iberia Airlines and Scandinavian Airlines System in 1987. Amadeus was formed as a European alternative to SABRE and American Global Distribution system. Amadeus became a pioneer in the travel industry through its activities of offering its content of various airline operators to travel agents and consumer's real time. By 1990's, Amadeus set standards by developing innovative and user friendly products, establishing its presence around the world physically and online also. All its products and services were specially designed to facilitate the making of travel arrangements for both leisure and corporate travel. By 2000, Amadeus received Quality certification from the International Standards Organization (ISO), the first company in the sector to undertake. Amadeus went public in 1999.

Amadeus worked on PNR system and initially was dedicated to the airline industry but later moved into sectors like hotels, railways, cruise, ferries, insurance etc. Amadeus also went beyond the reservation function to deliver services areas using information technology. Amadeus is the largest Global Distribution System provider in the world and according to 2009 data it held a market share of 37%. Amadeus had a network of 90,000 travel agencies and 58,000 airline sales offices using the system. Amadeus provides access to book content from 435 airlines, 29 car rentals, 280 hotel chains with 87,000 hotels, 200 tour operators and 116 travel insurance companies. Some of the notable achievements of Amadeus include

Computer Reservation System

- (a) It was included in Dow Jones Sustainability Index for 8th consecutive year.
- (b) It processed more than 645 million bookings in the year 2019.
- (c) More than 1.9 billion passengers boarded in 2019
- (d) Investing 7.5 billion euro in Research and Development since 2004.
- (e) Generation of revenue of 5.5 billion euro in 2019.

The business model of Amadeus include a booking or a transaction fee for each confirmed net booking done on the Amadeus Computer Reservation System. Amadeus acquired e-travel Inc. from Oracle Corporation and expanded their business domain into multiple areas providing solutions to e-commerce players worldwide. The solutions for Business travel Amadeus is providing are Sales and Marketing, Management of travellers, guests and customers, management of operations for flights, airports, hotels and property, management of business by streamlining operations and optimising through tools on process, expense management, financial accounting and back office. Amadeus also has created payment platforms for travel companies across the world and processes around 100 billion euro of travel payment. The company also has developed tools for analytics and intelligence for better decision making and actions in an organization. With its strong infrastructure, an array of diversified technology based products and services and a growing customer base, Amadeus is definitely one of the most significant players in shaping the future of global Global Distribution System.

2.4.2 SABRE :



Semi Automatic Business Research Environment (SABRE), is a travel and technology company based out of Texas in the United States of America. It is the largest Global Distribution System provider for air bookings in North America. The SABRE system is used by airlines, railways, hotels, travel agents and other travel companies.

❖ History :

The system was developed in 1953, when C.R. Smith, President of American Airlines met Blair Smith, an IBM salesman on a flight and developed the SABRE concept. The system for booking flights for American Airlines during that time was manual and the company was facing a lot of challenges. American Airlines was using techniques developed at their Little Rock, Arkansas reservation centre. The system used rotating file with cards for every flight, which a team of eight operators had to seek through. A mark was placed on the side of the card, if a seat was booked on a particular flight. It was only visually that these operators could determine whether the airline seats were full or empty. The time taken for looking up for seats, reserving and writing the ticket was very long.

A formal development for arrangement was signed by American Airlines in 1957 with IBM based on SAGE which IBM had developed for military use. The first system for trial was launched in 1960 using two IBM 7090 mainframe computers in a new data centre located in Briarcliff Manor, New York. The system was successful and processed around 84000 calls per day. In 1964, SABRE became the largest commercial real time data processing unit of the world. In 1976, the SABRE system was installed in a travel agency for the first time. SABRE introduced Bargain Finder, the first automated low fare search capability in its system and provided the consumer computer access to the SABRE system. In 1996, the company launched Travelocity and Online Travel Agency to meet

corporate needs. In the same year, SABRE became a separate legal entity followed by an Initial public offer, where the parent company released 18% of its shares to be publicly traded.

In 1998, the company formed a Joint venture with Abacus International to create SABRESONIC passenger solution, a customized version of subscribers in Asia. In 2001, Electronic Data Systems (EDS), purchased SABRE holdings. The company acquired lastminute.com in 2005. In 2007, SABRE Corporation was acquired by Texas Pacific Group and Silver Lake Partners. In 2014 SABRE Corporation went public on NASDAQ and in 2015 it sold its Travelocity brand to Expedia.

SABRE Corporation is headquartered at Southlake, Texas, United States of America. Sabre has a huge network of around sixty thousand travel agents globally. It has an association with more than 400 airlines, thousands of hotels and several car rental companies and cruise liners. Travelocity that SABRE sold to Expedia was once the leading online consumer travel website in the world. More than 32 million used the site generating revenue of more than 300 million USD. The site provided innovative technology and helped consumers to find the best air, car, hotel and vacation reservations. The business that SABRE owns are "GET THERE", a provider of web based corporate travel procurement, including the purchase of air, hotel, and cars and meeting planning services. The business has more than 800 leading corporations. SABRE Airlines Solutions, SABRE Travel Network Tripcase, SABRE Hospitality Solutions are other business of the company.

SABRE in 2018, generated revenue of 3.87 billion USD and employs more than 10,000 people around the globe. SABRE employs the best of the talent in the Industry and has been competitive through its deep penetration in the market. The product line of SABRE has been widely recognized and continuous research in its model and scale of operations has given it the necessary edge in the market. The model for business in electronic travel distribution and information technology solutions; SABRE is considered to be one of the most significant and competitive Global Distribution System leveraging human resources and technology systems.

❑ **Check Your Progress – 1 :**

1. Global Distribution System
 - (a) Enables retail travel agencies and online travel agent business models to succeed.
 - (b) Enables travel agents to penetrate the travel market globally with their services
 - (c) Provides easy access to corporate clients over specially designed platforms
 - (d) All of the Above
2. The first SABRE trial was undertaken using
 - (a) IBM 7090 mainframe
 - (b) Delta 7090 Mainframe
 - (c) IBM 7091 mainframe
3. In 2000, Amadeus received
 - (a) Dow Jones Award
 - (b) Quality Certification
 - (c) Best Company Award

Computer Reservation System

4. Amadeus in 2019 generated revenue of
- (a) 5.5 billion USD
 - (b) 5.5 billion Rupees
 - (c) 5.5 billion Euros

2.4.3 Galileo International :



With a mission of, "together we will make travel easier and more rewarding for everyone", Galileo started in

1971 when United Airlines created the first Computer Reservation System under the name Apollo. The Galileo International was founded in 1993 by 11 major North American and European airlines; Aer Lingus, Air Canada, Alitalia, Austrian Airlines, British Airways, KLM Royal Dutch Airlines, Olympic Airlines, Swiss Air, TAP Air Portugal, United Airlines and US Airways. Galileo is a major player in the Global Distribution System business throughout the world. Being a diversified global technology leader, the core business of Galileo International is a provider for GDS to travel partners across the globe through its computerized reservation systems, leading edge products and innovative internet based solutions.

Galileo International is part of Travel port worldwide limited that provides technology, payment solutions and distribution for the travel and tourism industry. With incorporation of the Galileo GDS, Travelport is the world's leader in technology related to travel. The company also provides information technology services to airlines. Travel Port worldwide limited was formed by Cendant in 2001 following its acquisitions of Galileo GDS for \$2.9 billion and Cheap Tickets for \$425 million. In August 2006, Cendant sold Orbitz and Galileo to The Blackstone Group for \$4.3 billion, forming Travelport. In August 2007, Travelport acquired Worldspan. On September 25, 2014, the company became public with an Initial Public offering on the New York Stock Exchange. In 2017, Travelport was the first GDS to be awarded the International Air Transport Association NDC (New Distribution Capability) Level 3 certification as an aggregator of travel content. In 2018, it became the first GDS operator to manage the live booking of flights using the NDC standard.

Galileo International represents 116 countries and serves travel agencies at approximately 45000 locations. It serves about 500 airlines, 227 hotel companies, 33 car rental companies and more than 368 tour operators. Galileo International is a member of IATA, OTA and SITA. Galileo's competitive strengths include market share, well balanced global presence, and relationship with diverse groups of travel vendors, technologically advanced information systems, highly skilled personnel ad a stable product line. Galileo has partnered with numerous airlines, Industry leaders and corporate bodies for augmenting sales, reaching the market, development of new products and venturing in various avenues of the travel market. With a focus on the distribution side of the business Galileo International pursues a strategy of global expansion. Galileo is a value added travel aggregator of travel inventory with strong global distribution, customer loyalty, leveraging technology and expanding choices for customers worldwide.

2.4.4 Worldspan :



Worldspan is a part of Travelport GDS business. The company is into development of technology and content as required by Travelport. The prime focus of the company is into development of travel related products that can available over the internet and easy mobility of information within the stakeholders of the travel network. The company has developed a lot Information Technology solutions for various travel partners. The company has its headquarters in Atlanta, Georgia, United States of America and is a member of International Air Traffic Association and SITA.

The company was formed in 1990 by Delta Airlines, Northwest Airlines and Trans World Airlines to operate and sell its Global Distribution System services to travel agencies worldwide. Worldspan expanded its business effectively throughout North America, South America, Europe and Asia. In 2003 Worldspan was sold to Citigroup venture Capital which in turn sold the business to Travelprt in 2007. Worldspan was formed in 1990 by the PARS partnership companies and Datas II a unit of Delta Airlines International. Further an alliance with an Asian company called ABACUS strengthened the technological aspect and the market position of Worldspan. Travelport acquired Worldspan by 2007. In 2012, the system migrated to a new fare pricing engine called 360 fares operating on a Linux based system.

With a varied product capability ranging from connectivity, ecommerce, travel support systems and inventory the system is used for travel services and products by travel agencies and OTA's. GDS integration by Travelpro provides complete technology for web based travel ecommerce offering solutions for conducting all kinds of travel business for B2C and B2B channels. Implementing Worldspan GDS software in the travel agency software business helps in reducing the implementation costs. The custom reporting module helps in the smooth functioning of the travel agency software and accomplishes the different transactions.

The benefits of pre-integrated Worldspan GDS include :

- Wide selection of travel content and huge network worldwide.
- Efficient way for marketing travel products.
- Instant booking confirmation options.
- Addition of properties to Worldspan travel software.
- Travel deals reachable to global corporate and leisure travellers.
- Real time update for users.

2.4.5 Travelport Worldwide Limited :

Travelport Worldwide Limited is a privately held company founded in 2001 with its headquarters at Langley, Berkshire, United Kingdom. The company provides technology, distribution, payment solutions for the travel and tourism industry. The company provides IT services to airlines such as shopping, ticketing and departure control. With a revenue of 2.5 billion USD in 2018, Travelpro ranks third after Amadeus and SABRE Corporation. The company was formed by Cendant in 2001 following its acquisition of Galileo GDS and Cheap Tickets. In 2004 the company acquired Orbitz and Flairview Travel. In 2005 the company acquired e bookers and Gulliver's travel associates. In 2006, Cendant sold Orbitz

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and Galileo to the Blackstone Group and formed Travelport. In 2007, Travelport acquired Worldspan and in 2010, Spruce.com. In 2014, the company became a listed company on the New York Stock Exchange. In 2017, Travelport was the first GDS to be awarded the International Air Transport Association, New distribution capability level 3 certificate as an aggregator of travel content. It started managing the live booking of flights using the NDC content.

The merchandising suite of Travelport comprises of 3 components designed to help transform the way airlines deliver and display their products to the travel agents. They are

- Aggregated shopping is integrated in the same selling screens through an Application Programming Interface (API) connection.
- Ancillary services are enabled to help travel agents to sell to customers the increasing range of ancillaries that airlines have to offer apart from the travel eg Checked baggage, premium seats lounge passes etc directly from the Travelport point of sale.
- Travelport content and branding allows airlines to more effectively display their full range of products for sale in the intermediary channel in line with how they sell on their own websites. The same includes detailed product descriptions, imagery and all other aspects.

Around 150 airlines are live with Travelport content and branding. Travelport has added over 100 airlines since 2015 demonstrating the value of Travelport's technology.

❑ Check Your Progress – 2 :

1. The Galileo International was founded in 1993 by
 - (a) 11 major North American and European airlines
 - (b) 10 major North American and European airlines
 - (c) 11 major North American airlines
 - (d) None of the above
2. The Galileo International is part of
 - (a) Cendant Corporation
 - (b) Travelport Worldwide
 - (c) Travelcom Worldwide
3. The headquarters of Worldspan is in
 - (a) Seattle
 - (b) Atlanta
 - (c) Paris
 - (d) Washington DC
4. Worldspan was formed in 1990 by
 - (a) COVIA and DATAS II
 - (b) PARS partnership companies and Datas II
 - (c) PARS partnership companies and COVIA
 - (d) None of the above
5. "Together we will make travel easier", is the mission of which GDS company
 - (a) Galileo
 - (b) Sabre
 - (c) Amadeus
 - (d) Worldspan

2.5 LET US SUM UP :

A Global Distribution System is a computerized network system owned by a company that helps travel industry service providers like airlines, hotels, car rental companies etc to enable transactions with travel agents and customers using a real time inventory. Operators of the GDS systems have revolutionized the way how travel happens through ease of booking, getting real time data of airlines, branding, distribution, marketing and publicity. The innovative tools of GDS companies have integrated all the stake holders of travel into a virtual reality world.

2.6 ANSWERS TO CHECK YOUR PROGRESS :

Check Your Progress 1 :

1. All of the above
2. IBM 7090 mainframe
3. Quality Certification
4. 5.5 billion Euro

Check Your Progress 2 :

1. 11 major North American and European Airlines
2. Travelport Worldwide
3. Atlanta
4. PARS partnership companies and DATAS II
5. Galileo

2.7 GLOSSARY :

OTA : Online Travel Agent

PNR : Passenger Name Record

IBM : International Business Machines

NDC : New Distribution Capability

LINUX : Lovable Intellect Not Using XP

2.8 ASSIGNMENT :

❖ **State True or False :**

Statement	True/False
The access to more than one system to travel agents was permitted in 1984.	
Farelogix is a GDS used for ticket booking	
GDS enables retail travel agencies and OTA business models to succeed.	
Amadeus is listed in the Forbes list of "The world's largest public companies"	
SABRE was formed by alliance of American Airlines and Scandinavian Airlines	
Bargain Finder is a low fare search capability was introduced by SABRE	

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Galileo was founded by 11 major North American and European Airlines	
Worldspan is a part of Citigroup	
Worldspan only provides ticketing solutions in B2B platform	
Travelport acquired Galileo in 2001	

2.9 ACTIVITIES :

Visit websites of major GDS and list down the services offered by the companies.

Find out how technology allows GDS systems to operate in a real time environment.

2.10 CASE STUDY :

Raj and Company is a pioneer in travel agency business based out of Mumbai, India. They established their business when the airline industry was about to boom. The paper ticketing system was still in practice; however, different CRS had started penetrating the market worldwide. Anticipating a drastic change, the company installed all the required hardware necessary to move to computerized platform. The company had international business too, and contacted different CRS providers for support and the required transition. Finally the company signed an agreement with a leading CRS provider, but within a short frame started facing a lot of challenges in the process for booking international tickets. The challenges faced by the company were

- i. Limited accessibility to number of airlines they could book ticket for
 - ii. High subscription fees being paid to CRS provider.
 - iii. High installation cost of Software and Training.
 - iv. Additional fees for co-hosting or booking in other airlines being charged
 - v. More fare amount paid by customers.
1. How did the problem faced by travel agencies like Raj and company resolve with time ?
 2. How do GDS function and what are the benefits that GDS offers to travel agents, customers and airlines ?

2.11 FURTHER READING :

<https://www.provab.com>

<https://www.sabre.com>

<https://www.sabretravelnetwork.com>

<https://www.travelport.com>

<https://www.onlinetraining.com>

<https://www.videcom.com>

<https://www.amadeus.com>

<https://www.traveltechnik.com>



UNIT STRUCTURE

- 3.0 Learning Objectives
- 3.1 Introduction
- 3.2 Building Fare Calculation
- 3.3 Equivalent Fare Paid
 - 3.3.1 Constructing Fare Calculation by using NUC
- 3.4 Intermediate Points
- 3.5 Surface Sectors
- 3.6 Determining Global Indicators and Fare Construction
- 3.7 Fare Construction
- 3.8 Fare Calculation for Return Journeys
- 3.9 Fare Calculation for Round the World Journey
- 3.10 Let us Sum Up
- 3.11 Answers to Check your Progress
- 3.12 Glossary
- 3.13 Assignment
- 3.14 Activities
- 3.15 Case Study
- 3.16 Further reading

3.0 LEARNING OBJECTIVES :

- To understand fare calculation methods and techniques through different itineraries and determining factors.

3.1 INTRODUCTION :

Passenger Air Tariff jointly published by IATA and SITA and uses authoritative data sources to supply Industry and PAT participating carriers information to the air transport Industry worldwide.

3.2 BUILDING FARE CALCULATION :

To calculate fare the following aspects are a part of the same.

- The Origin of journey
- The termination point or destination of the journey
- Name of the Aircraft (carrier) the journey is undertaken.
- The calculation of the fare with the currency.
- The taxes that are to be paid.
- The spacing element in fare calculation
- The current Rate of Exchange and the NUC.

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Let's take an Example for understanding the fare calculation in simple terms :

A ticket for One Way was bought for journey from Dubai (DXB) in UAE to Riyadh (RUH) in Saudi Arabia on Emirates (EK) at 120.00 AED.

Fare calculations begin with the source city or Airport with the code from where the traveller commences the journey. The journey always ends at the City or Airport where the traveller arrives.

Commencement of Journey in the example : Dubai– DXB

Arrival point of the journey in the example :Riyadh–RUH

To complete the journey from the commencement points and Arrival points there should be a carrier (the airline in which the passenger shall be travelling).

The carrier in the above example is Emirates– EK

The calculation of fare also comprises of the amount paid for the ticket and the currency in which the amount was paid for the ticket.

The amount paid in the above example is 120.00 and the currency in which the amount is paid is AED.

Two decimal places are always mentioned for writing the currency in which the amount is paid – 120.00 AED

The amount paid is mentioned during fare calculation twice; once before the currency and also after the currency.

In the above example the amount paid should be mentioned as – 120.00 AED 120.00

The word "END" should be mentioned after the amount paid indicating an end to the itinerary.

120.00 AED 120.00 END

The Rate of Exchange for the currency in which the purchase was done is mentioned after the "END".

In the above example as Emirates is a flight from UAE and the currency of UAE is AED and also the purchase was done in the same currency the Rate of Exchange would be 1.00000

In an itinerary the Rate of Exchange is mentioned in 5 decimal places.

In the above example it would be written as ROE 1.00000

Taxes if paid any start with XT.

So from the above example the fare calculation is

DXB EK RUH 120.00 AED 120.00 END ROE 1.00000

The rule of spacing for fare calculation mentions that there should be a space between words (alpha) and no space between digits (numeric). An underscore sign (_) is used for the space. So if we reconstruct the above fare calculation it is

DXB_EK_RUH120.00AED120.00END_ROE1.00000

The under mentioned table categorizes the aspects that are categorized under Alpha and Numeric.

Alpha aspects in Fare calculation	Numeric aspects in Fare Calculation
City or Airport codes	Fare
Currency	Value of Rate of Exchange
Rate of Exchange	Tax Rates
Mileage	
Surcharges	
Inclusive Tour/Bulk Tour IT/BT	
END	
Tax Codes	

Using the reference of the above example if we have to write the fare calculation of the following :

One Way ticket to travel from Dubai (DXB), UAE to Bangalore (BLR), India on Emirates (EK). If the ticket is purchased for 300 AED in Dubai the itinerary shall be written as.

DXB_EK_BLR300.00AED300.00END_ROE1.00000

Let us now consider another example for writing the Fare calculation for the itinerary :

Return Trip to travel from Dubai (DXB) to Heathrow (LHR), in United Kingdom and Return back to Dubai. The passenger will travel from Dubai to Heathrow Airport in London on Emirates (EK) and will return to Dubai from Heathrow Airport London by British Airways (BA). The ticket was purchased for 800 AED at Dubai.

DXB_EK_LHR_BA_DXB800.00AED800.00END_ROE1.00000

❑ Check Your Progress – 1 :

1. A Fare calculation should contain the following elements
 - (a) Origin
 - (b) Spacing in Fare Calculation
 - (c) Rate of Exchange
 - (d) All the options
2. In writing a Fare calculation, in between Arrival and Departure points
 - (a) Code of the carrier should be mentioned
 - (b) Airport code should be mentioned
 - (c) City Code should be mentioned
 - (d) None of the above
3. The currency is always written
 - (a) In five decimal places in fare calculation
 - (b) In four decimal places in fare calculation
 - (c) In two decimal places in the fare calculation
 - (d) In three decimal places in fare calculation
4. Any taxes after the Rate of Exchange starts with
 - (a) XT
 - (b) XX
 - (c) XY
 - (d) XZ

3.3 EQUIVALENT FARE PAID :

When an airline ticket is purchased in a currency that is not the currency of the country a calculation of the fare paid in the currency of the country has to be undertaken. The same is referred to as an Equivalent fare paid. To undertake the same the rate of exchange has to be calculated before the fare construction.

Why do we need to calculate the Equivalent Fare Paid ?

Equivalent Fare Paid is calculated for the purpose of audit and accounts for the airline which is done in the currency of the source of the airline.

Example :

Suppose a One Way ticket purchased to travel from Dubai (DXB) to Riyadh (RUH) on Emirates (EK) was at 120.00 USD.

The first step is to look up for the Bank Selling Rate. **1 USD=3.67 AED.**

The fare calculation is as

DXB_EK_RUH120.00USD120.00END_ROE3.67000

Let us look into the above example again. The ticket was purchased to travel DXB to RUH on Emirates (EK). The ticket was not purchased in UAE and was purchased in USD. The passenger paid a price of 54 USD for the ticket. The same ticket was listed at 200AED in UAE. The Equivalent fare to be paid is calculated at

Selling Rate at Bank : 1 AED= 0.27 USD

Fare in Local Currency = 200.00 AED

Equivalent Fare Paid = $200.00 \times 0.27 = 54$ USD

The Fare calculation after the Equivalent Fare Paid calculation stands at :

DXB_EK_RUH54.00USD54.00END_ROE0.27000

In our earlier module in Block 2 we have studied about Neutral Unit of Construction (NUC). You know that a NUC is a standard currency used by IATA for the airlines for fare calculation. During calculation of fares when currencies of two or more countries are in use it always converted to Neutral Unit of Construction (NUC).

The value of NUC as standard is : **1 NUC = 1 USD i.e. 1.00 NUC is equivalent to 1.00 USD.**

Example :

For a journey from Dubai to London with a stop at Madrid in Spain and back to Dubai, there is involvement of currencies of different countries. The fares cannot be calculated in two different currencies and NUC has to be used as a Standard Currency.

3.3.1 Constructing a Fare using NUC :

- **Step 1 :** Convert all currencies into NUC through the IATA RATE OF EXCHANGE (IROE) $1.00 \text{ NUC} = 1.00 \text{ USD}$.
- **Step 2 :** The ROE should be the local currency rate for NUC.

Example :

One Way ticket purchased at Dubai (DXB) at 200 AED for Dubai (DXB) to Riyadh (RUH) on Emirates (EK).

The calculation of the fare in AED would be

DXB_EK_RUH200.00AED200.00END_ROE1.00000

To change this Fare calculation in NUC :

Currency in NUC= 200X0.27 (1 NUC = 1 USD and 1 AED= 0.27 USD)
= 54.00 NUC

The Fare calculation would be

DXB_EK_RUH54.00NUC54.00END_ROE0.27000

3.4 INTERMEDIATE POINTS :

The stop points where a passenger will stop in the course of the journey is called Intermediate point. An intermediate point may be chosen by a passenger during the booking of his ticket (voluntary) or be a part of the airline itinerary (involuntary). Intermediate Points can have a stopover (Intermediate points where passenger will stop for more than 24hours referred also as Transfer Point) or may not have a stopover (Intermediate points where the passenger will stop less than 24 hours and is also referred to as a Transit Point). A No Stopover point in a fare calculation is shown as X/.

Example :

A couple from Dubai (DXB) intends to visit Paris (PAR) and then Athens (ATH) and back to Dubai on a vacation.

A Return trip (RT) ticket was purchased in Dubai at 600 AED to travel from Dubai (DXB) to Athens (ATH) with a stop point of 2 days in Paris. The journey will completely be done on Emirates (EK). In this example, the intermediate or stop over point is Paris (PAR) Therefore the fare calculation will be represented as :

DXB-EK-PAR-EK-ATH-EK-DXB600.00AED600.00END ROE1.00000

Example of a No Stopover point fare calculation :

A ticket purchased to travel from Dubai (DXB) to Athens (ATH) on Emirates (EK) at 600AED. A stop of 2 hours in Paris (PAR) will be undertaken by the aircraft before proceeding for its journey to Athens. The Fare calculation shall be :

DXB_EK_X/PAR_EK_ATH600.00AED600.00END_ROE1.00000

3.5 SURFACE SECTORS :

Many a times passengers use multiple means to travel from one destination to another and same is referred to as Surface sector. The other means of travel may be charged within the fare by the airlines or may not be charged as per the agreements that the airlines has with the mode of travel used by the passenger. In fare calculation a surface sector is shown as /- or //.

/- : This symbol is for an unpaid surface sector.

// : This symbol is for a Paid Surface sector.

Example of a Surface Sector :

An airline ticket was purchased to travel from Dubai (DXB) to Athens (ATH). The passenger will stop in Paris (PAR) and travel by Eurorail to Athens and then return back to Dubai by plane from Athens.

The amount paid for the ticket was 1000AED in Dubai and the journey will done completely by Emirates (EK) by the passenger. The Fare Calculation :
DXB EK PAR /- ATH EK DXB1000.00AED1000.00END ROE1.00000

3.6 DETERMINING GLOBAL INDICATORS AND UNDERTAKING FARE CONSTRUCTION :

You have learnt basics of writing a fare calculation and also learnt in the previous units how to determine Global Indicators. Let's recapitulate as below through examples

Example 1 :

Perth (PER) in Australia to Jakarta (JKT) in Indonesia

Perth is in Traffic Conference Area 3 (TC3) and Jakarta is also in Traffic Conference Area 3 (TC3). As the entire travel is in the Eastern Hemisphere the Global Indicator (GI) for the itinerary is EH.

Example 2 :

Sydney (SYD) in Australia to London (LON) in United Kingdom via Singapore (SIN)

Sydney is in Traffic Conference 3 (TC 3) from where the journey originates and the destination London is in Traffic Conference 2 (TC 2) via Singapore which is in Traffic Conference 3 (TC 3). The Global Indicator (GI) for the travel is EH.

Example 3 :

Sydney (SYD) in Australia to London (LON) in United Kingdom via Los Angeles (LAX) in United States

Sydney is in Traffic Conference 3 (TC3) from where the journey originates and London is in Traffic Conference 2 (TC2) where the journey commences. There is a stopover at Los Angeles which is in Traffic Conference 1(TC 1). The flight here crosses both the Pacific and the Atlantic Ocean from its source to reach the destination and the Global Indicator (GI) for the same is AP (Atlantic Pacific).

3.7 FARE CONSTRUCTION :

You have learnt how to determine and build a fare calculation and to determine the right Global Indicator by looking at the itinerary and the destinations that fall under different Travel Conference areas that the itinerary describes during the actual travel. In the earlier unit you have learnt about Maximum Permitted mileage (MPM). It is the value in miles assigned between two cities. IATA has a general plan of all MPM values for different itineraries available in the Travel companion manual of IATA and used for any ticketing and fare purpose. You have also learnt in the earlier unit in Block 2 about Ticketed Point Mileage (TPM). TPM is the actual miles travelled in the journey. Let us understand the calculations through an example.

Example 1 :

SYD_QF_X/SIN_QF_LON6335.61AUD6335.61END_ROE1.00000

If we break the above statement into components and look into the fare calculation

Origin of Journey	Sydney, Australia (SYD)
Destination	London, United Kingdom (LON)
Journey VIA	Singapore (SIN)
Carrier	Qantas Airways (QF) . Australian Airlines
X/	Stopover at Singapore less than 24 hours
Currency for Purchase of Ticket	Australian Dollars
Purchase Price	6335.61 AUD
Global Indicator	EH
NUC Value	1 NUC = 1 USD
	1 AUD (Australian Dollar) = 0.72 NUC
	To Convert : 6335.61 AUD X 0.72 NUC = 4561.63 NUC NUC VALUE = 4561.63
Maximum Permitted Mileage (MPM) as per IATA table for the above itinerary	13222
Ticketed Point Mileage (TPM)	SYD to SIN 3900 miles SIN to LON 6102 miles TPM 10002 miles
<p>In this case the TPM is lower than MPM i.e. the actual distance travelled is lower than the permitted distance travelled. In this case there is no surcharge that is applicable to the fare for the ticket purchased. Surcharge happens in itineraries where the TPM exceeds the MPM and is known as Excess Mileage Surcharge (EMS). The formula for calculating surcharge on NUC is TPM/MPMX100. The figure that comes out of the formula needs to be looked into the fare surcharge chart provided by IATA. The corresponding figure vis a vis the table would interpret whether a surcharge of 5%, 10%, 15%, 20% or 25% would be applicable to itineraries. Surcharging is an important point to remember in fare calculation otherwise tickets might be undercharged for certain itineraries</p>	
EMS (Extra Mileage Surcharge)	M
	No Surcharge is levied for the above itinerary and M is written which indicates that the journey is in Miles

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Example 2 :

SYD_QF_X/JNB_QF_LON6335.61AUD6335.61END_ROE1.00000

If we break the above statement into components and look into the fare calculation

Origin of Journey	Sydney, Australia (SYD)
Destination	London, United Kingdom (LON)
Journey VIA	Johannesburg, South Africa (JNB)
Carrier	Qantas Airways (QF). Australian Airlines
X/	Stopover at Johannesburg for less than 24 hours
Currency for Purchase of Ticket	Australian Dollars
Purchase Price	6335.61 AUD
Global Indicator	EH
NUC Value	1 NUC= 1 USD 1 AUD (Australian Dollar) = 0.72 NUC To Convert : 6335.61 AUD X 0.72 NUC = 4561.63 NUC NUC VALUE = 4561.63
Maximum Permitted Mileage (MPM) as per IATA table for the above itinerary	13222
Ticketed Point Mileage (TPM)	SYD to JNB 3893 miles JNB to LON 4817 miles TPM 13710 miles
<p>In this case the TPM is higher than MPM i.e. the actual distance travelled is higher than the permitted distance travelled. In this case normally a surcharge would be applicable but there is a step before calculating the Extra Mileage Surcharge (EMS). There is a provision of Extra Mileage Allowance (EMA) permitted on Extra Mileage Surcharge on various itineraries as decided by IATA. The allowance of a TPM deduction is given to passengers because of the airline taking a longer route. The passengers are not penalized with extra fare. The same reference can be taken from the Extra Mileage Allowance from the IATA manual</p>	
Extra Mileage Allowance (EMA) as per the itinerary in the IATA manual	518
New Ticketing Point Mileage (NTPM)	TPM-EMA = 13710- 518 = 13192
<p>The New Ticketing Point Mileage is less than the Maximum Permitted Mileage and hence there would be no surcharge admissible in this case.</p>	
EMS (Extra Mileage Surcharge)	M
	No Surcharge is levied for the above itinerary and M is written which indicates that the journey is in Miles

3.8 FARE CALCULATION FOR A SIMPLE RETURN JOURNEY :

In the above example you have learnt about one way fare calculation. Now you will be acquainting yourself with calculating a return journey with an example.

Example :

The itinerary for the journey is as

Brisbane (BNE) to Hong Kong (HKG) by Cathay Pacific airlines (CX).
 Hong Kong(HKG) to Bangkok (BKK) by Cathay Pacific Airlines (CX) and
 Bangkok (BKK) to Brisbane (BNE) by Qantas Airways (QF).

In calculating the fare for the above itinerary, you have to first determine where should the Fare Break Point going to be. It can either be at Brisbane to Hong Kong or it can also be at Brisbane to Bangkok. The rule for establishing Fare Break Point for a Return journey is to establish the Maximum Permitted Mileage from the point of origin to the destination. The destination with the higher MPM is considered as the destination for Fare Break Point.

BETWEEN DESTINATIONS	ONE WAY (HALF ROUTE RETURN NUC FARE)	MPM
Brisbane (BNE) to Hong Kong	3212.26	5181
Brisbane (BNE) to Bangkok (BKK)	2857.96	5434

If you look into the above table there are few things for you to understand :

- The fare considered is the half of the return fare in NUC from the Origin of the destination and back. So if the Return NUC fare from Brisbane to Hong Kong to Brisbane is 6424.52, the half route fare in NUC for the same is to be considered which is 3212.26.
- The Maximum Permitted Mileage (MPM) as per the manual for the destinations is put next. In the above case you can see that though the NUC fare for BNE to BKK is lesser but the MPM is higher. The Fare Break Point is calculated in fare calculation based on the MPM and in the above case the Fare Break Point chosen shall be BNE to BKK.
- To do the Fare calculation ahead there are now 2 journeys.

Outbound Journey Fare : Brisbane (BNE) to Bangkok (BKK)

Inbound Journey Fare : Bangkok (BKK) to Brisbane (BNE)

If the Fare Construction is undertaken for the above :

	BNE-BKK	BKK-BNE
	Outbound	Inbound
Global Indicator (GI)	EH	EH
The journey is in the Eastern Hemisphere so the GI is EH		
NUC	2857.96	2857.96
Maximum Permitted Mileage (MPM)	5434	5434
Ticketed Permitted Mileage (TPM)	5367	4176

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The TPM from BNE to BKK by CX was 5367 miles whereas the TPM from BKK to BNE by QF was 4176 miles. It may differ due to routes taken by different airlines.		
EMA	–	–
NEW TPM	–	–
EMS	M	M
There is no Extra Mileage Surcharge as the TPM is lower than MPM in both the Outbound and the Inbound journey. However since the itinerary has a stopover at Hong Kong, the authorities at Hong Kong airport charge a 33 Hong Kong dollar surcharge as a Security tax that needs to be included in the ticket. The tax when converted to NUC will have a formula of 33 / ROE. The value approximately comes to 4.23 NUC. This surcharge has to be mentioned in the Fare Construction with the letter Q.		
Total NUC	2857.96	2857.96
ROE for AUD	1.356208	1.356208
The ticket in the above example has been purchased in Australia and needs to be converted to Australian Dollars (AUD).		
Value in AUD	3875.98821	3875.98821
Total Value in AUD	7751.97643	
Rounding Off_ Total Value in AUD	7752.00	

Fare Construction for the Itinerary :

The fare calculation for the above itinerary shall be as follows :

**BNE_CX_HKG_CX_BKK_Q_4.23M2857.96QF_BNE_M2857.96
NUC5720.16END_ROE1.356208AUD7752.00**

3.9 ROUND THE WORLD JOURNEY :

The fare calculation for around the world journey is mentioned below through an example :

❖ **Itinerary :**

Sydney (SYD) in Australia to Los Angeles (LAX) in United States to Paris (PAR) in France to Singapore (SIN) to Sydney (SYD)

If we look at the above itinerary, it covers the entire globe. The travel is happening through all the Traffic Conference Areas. The first step is to determine Fare Break Point (FBP). In Around the World journeys, a FBP happens in a city in Traffic Conference Area 2 (TC 2). It is generally in a city in United Kingdom or it may happen in any city in Europe or in a city in TC 2. In the above itinerary Paris (PAR) is the only city in Traffic Conference 2 and hence the Fare Break Point to be considered is Paris.

Outbound Fare : Sydney (SYD) to Paris (PAR)

(Here the flight crosses both the Atlantic and the Pacific Ocean to reach Paris from Sydney and hence the Global Indicator (GI) is AP.

Inbound Fare : Paris (PAR) to Sydney (SYD)

(Here the flight travels from TC 2 to TC 3 without crossing either the Atlantic or the Pacific Ocean and hence the Global Indicator (GI) is (EH.)

SYD–LAX–PAR (Out Bound)	GI – AP NUC – ½ Route to be chosen as in above example of the Return fare MPM – 15271 miles	The NUC shall be looked up for Sydney to Paris fare in GI of AP.
PAR–SIN–SYD (In bound)	GI – EH NUC – ½ Route to be chosen as in above example of the Return fare MPM – 12994	The NUC shall be looked up for Paris to Sydney fare in GI of EH
The reason for difference in MPM is due to the different routes undertaken by flight.		

The fare calculation then can be undertaken as the above example taking the value of NUC for the Outbound and the inbound journeys.

❑ Check Your Progress – 2 :

1. An Equivalent fare paid is
 - (a) The money paid to purchase a ticket in a currency other than that of currency of country
 - (b) The money paid to purchase a ticket in US Dollars
 - (c) The money paid to purchase a ticket in some other country using US Dollars
 - (d) None of the above
2. Intermediate points with a stopover of more than 24 hours is called
 - (a) Transit Point
 - (b) Transfer Point
 - (c) Inter Point
 - (d) Stop Point
3. When a passenger uses other means to travel other than airlines, in fare calculation it is known as
 - (a) Domain Sector
 - (c) Transport Sector
 - (c) Movement Sector
 - (d) Surface Sector
4. Value in miles assigned between two cities is known as
 - (a) TPM
 - (b) EMA
 - (c) MPM
 - (d) MOM
5. Fare Break Point is calculated at
 - (a) The destination with the higher MPM
 - (b) The destination with the higher TPM.
 - (c) The destination where ticket value is high
 - (d) None of the above

3.10 LET US SUM UP :

In the module you been acquainted with different fare calculation procedures. The Passenger Air Tariff is a guide that helps you with various aspects of air travel and is published by IATA. There are calculations and procedures indicated for calculating airfares. You have to study and observe each step carefully and try to practice through creating your own itineraries.

3.11 ANSWERS TO CHECK YOUR PROGRESS :

❑ Check Your Progress 1 :

1. All the options
2. Code of the carrier should be mentioned
3. In two decimal places in the fare calculation
4. XT

❑ Check Your Progress 2 :

1. The money paid to purchase a ticket in a currency other than that of currency of country.
2. Transfer Point.
3. Surface Sector.
4. MPM
5. The destination with the higher MPM

3.12 GLOSSARY :

SITA : Societe Internationale de Aeronautiques

AED : United Arab Emirates Dirham

ROE : Rate of Exchange

XT : Indication for any taxes to be mentioned after ROE

IT : Inclusive Tour

BT : Bulk Tour

RT : Return Trip

OWT : One Way Trip

X/ : Indication for Stopover

/- : Indication for unpaid surface sector

//- : Indication for paid surface sector

3.13 ASSIGNMENT :

Explain the itinerary : **DXB_EY_BLR320.00AED320.00END_
ROE1.00000**

Explain the itinerary : **AMD_6E_X/JPR_6E_CCU3000.00Rs3000.00_
ROE1.00000**

Explain the itinerary : **DEL_AI_BLR100.00USD100.00END_
ROE74.93000**

A one way ticket was purchased at BLR at Rs 4500 for an itinerary CCU to BLR. Calculate the NUC value of the ticket.

Explain the itinerary : **CCU_SQ_SIN/-KUL_SQ_CCU1500.00Rs1500.00
END_ROE1.00000**

Calculate the fare for the following itinerary :

PER_QF_X/KUL_QF_PAR375.20AUD375.20END_ROE1.00000

3.14 ACTIVITIES :

Undertake imaginary itineraries between different travel conference areas and GI's. Do fare construction for the itineraries chosen.

Check out online references and videos for different fare construction examples and note them for ready reference.

3.15 CASE STUDY :

Mr. Brown travelled from SYD to SIN by SQ. He then did a stopover for 3 hours at SIN and travelled from SIN to CCU by SQ. He stayed in India for five days on a business tour and travelled back from CCU to SYD by AI.

Itinerary	NUC Fare Return	MPM	TPM
SYD to SIN	4500.00	5015	5200
SYD to CCU	7520.00	9135	9500

Answer the following questions :

1. The Source City of Travel, the Stopover City, the Destination City, the services of Airlines undertaken to complete the itinery.
2. Determine Fare Break Point.
3. Determine the GI for the itinerary.
4. Write the purchase value of the ticket in AUH.
5. Write the Fare Construction for the itinerary.

3.16 FURTHER READING :

General Rules – Passenger Air Tariff; <https://www.passengertariff.com>

Training Extract; <https://www.passengertariff.com>

Worldwide Fares; <https://www.passengertariff.com>

Worldwide Rules; <https://www.passengertariff.com>

The Sage International Encyclopaedia of Air Tariff; <https://sk.sagepub.com>

<https://www.iata.org>

<https://servicehub.amadeus.com>

Airfares and Ticketing; <https://stonebridge.uk.com>

BLOCK SUMMARY :

The block has vividly provided an insight into the evolution and history of Computer Reservation Systems used for storage and retrieval of information for airlines, hotels, Car Rentals, Railways, Cruise liners and other services. The block lists the advantages of the Computer Reservation System over the manual systems. With the advancement of technology and the need for global presence, Computer Reservation System formulated by various airlines provided access to their domain to Global Distribution System companies. These companies accessed real time data over the servers of the hosts and offered services to stake holders in real time over the internet. Today major GDS players manage every aspect of ticketing and services online. The GDS providers also provide other technology based services and develop software that enables management of the ticketing business better and efficient. The block has provided you with detailed knowledge about the major GDS companies in the world.

The final unit in the block deals with the fare construction aspect with relevant examples to have a better understanding. The unit is very important for you to undertake fare calculations for several itineraries. You are advised to create itineraries of your own and practice to have a better learning about different types of fare calculations.

BLOCK ASSIGNMENT :

1. What is Computer Reservation System ? List the objectives of Computer Reservation System ? List five benefits of using CRS for airline booking ?
2. What is Global Distribution System ? How did Global Distribution Systems emerge ? List the benefits of Global Distribution Systems ?
3. Explain in detail about two major Global Distribution Systems ?