ELECTRONIC TOURISM

Tourism refers to activities of people traveling to and staying in places outside their usual environment for leisure, business or other purposes for not more than one consecutive year.

Wildlife traditionally refers to undomesticated animal species, but has come to include all plants, fungi, and other organisms that grow or live wild in an area without being introduced by humans.

Wildlife tourism is defined as tourism undertaken to view and/or encounter wildlife. It can take place in a range of settings, from captive, semi-captive, to in the wild, and it encompasses a variety of interactions from passive observation to feeding and/or touching the species viewed.

Electronic tourism means the application of ICTs in the tourism industry, which includes digitization of all processes and value chain in the tourism, travel, hospitality and catering industries. An Electronic tour operator Creates combined tourism products (as flights & accommodation, and other services) and distribute these products directly online or through travel agents.

ICT APPLICATIONS IN WILDLIFE TOURISM MANAGEMENT PROCESSES

The exchange of information is very important at every stage in the sales cycle of the tourism product. It must be able to flow quickly and accurately between the client, intermediaries and each of the tourism suppliers involved in servicing the client's needs.

ICT has become an almost universal feature of the tourism industry. Its power allows information to be managed more effectively, and transported worldwide almost instantly. As a result, it has had (and continues to have) a major effect on the methods of operation of the tourism industry.

Analyzing the role of ICT in E-Tourism

In order to analyze the role of ICT in helping the tourism industry, one has to distinguish the following actors/partners:

- *Business*: the other businesses or enterprises making transactions with the enterprise. This issue deals with business-to-business trade
- *Consumer:* the final customer or consumer buying the products or the services of the enterprise. This point mainly addresses the retail commerce
- *State:* the public authorities which often are partners in the trade or commerce processes. This aspect mainly refers to the role of public authorities.

There are three kinds of generic activities in trade and commerce which can be supported and improved by ICT:

- *Boundary*: an enterprise can use ICTs to improve its information gathering capability and better interact with its environment by getting and sending information outside its boundaries.
- *Relation:* an enterprise can use ICTs to support and improve its cooperative relations when making transactions with its partners (i.e. supplier, customer, consumer, value-added provider, third-parties)

- *Market:* a group of companies (competitors, buyers and sellers) can use technologies to improve their global efficiency or competitiveness when reaching their markets.

Business-to-business trade

The traditional view of the enterprise with clear boundaries, limited relations with partners and stable markets is evolving. Today ICT can leverage a redesign of the inter organizational relations allowing the enterprises to

a) Get better at gathering information about their out-of-boundary environment, and
b) Share electronic platforms and markets with their competitors.

Reaching the consumers

Firms communicate with their customers through various media. For several years, the ICTs have been deeply altering the traditional view of marketing, shopping and retailing media.

The computer-mediated environments such as the Minitel, CompuServe, and particularly the Internet allow *another* way of reaching consumers and online marketers plan to increase their online spending in order to be

- Better at communicating with their customers,
- More efficient in their selling relations with their customers,
- More attractive on their consumer markets, especially the new electronic or information mall. An information mall could be considered as an on-line place where a large number of on-line buyers and sellers can easily congregate and where commerce can be centered.

The role of the public sector

In most countries, governments clearly play a significant role in electronic commerce and electronic markets as they did for previous infrastructure developments (such as railroad, aviation and highways).

In its various roles as regulator, educator and promoter, government and public administrations can use ICT to establish the rules and the incentive structure that will help determine private sector choices.

The public sector has many incentives to promote and sustain electronic market solutions for its own rationalization but also to help the enterprises leverage the best of these new technologies in the global information-based society.

The public authorities can use ICT in order to

a) widely dispatch information collected and structured to help their local businesses reach new markets, and
b) create and sustain electronic platforms and markets

Innovative applications of ICT

These applications target three large segments of the industry:

I. corporate customers and business travel,
II. individual customers and leisure travel, as well as
III. Groups of people traveling to congresses and exhibitions.

They leverage extended enterprise technologies to improve the level of service offered to customers and the competitiveness of the actors selecting them.

A business travel process management application for corporate customers

Companies look at business travel management processes. The goal is double:

I. to use process redesign methodologies to streamline these processes and lower their cost on one side, and
II. Leverage technology, enforce policies and start collecting consolidated data on travel management in order to negotiate future discounts with suppliers.

A travel mall for individual customers and leisure travel

A traveler who would decide to use the Internet today to help prepare a trip to some holiday location would find many sources of information. The World-Wide-Web is a support to multiple servers describing the offerings of countries, tourist regions and travel suppliers (airlines, cruise lines, hotels, rental car companies, etc.)

An integrated travel environment for congress organizers

The use of technology to improve travel distribution practices is targeted to the organizers of exhibitions and congresses. The context we use in this handout is a conference with multiple breakout sessions running in parallel, and a large exhibition with various companies presenting their products. Planning to go to these events includes two components

I. buying travel products and
II. Planning the conference itself.

Tour operators

A **tour operator** is an Individual or company that typically combines tour and travel components to create a package holiday. They advertise and produce brochures to promote their products, holidays and itineraries.

The most common example of a tour operator's product would be a flight on a charter airline plus a transfer from the airport to a hotel and the services of a local representative.

Tour operator's functions

- Offer a significant contribution to the tourism distribution channel
- Arrange package tours which offer a combination of aircraft seats & beds in hotels & transfers & tours
- Sell or offer packages for sale, directly to the consumer or through a travel agency
- Set up packages at a single price, which are standardized & repetitive
- Provide a one stop shop for travelers
- Make the purchase price of the package holiday attractive to potential holiday makers
- Buy in bulk which generates immense discounts
- Packages account for a large amount of the leisure travel products

Tour operator's types & structures

- Northern European tour operators:
  - Dominate the leisure travel market
  - Have standardized packages
  - Are horizontally integrated
- **Southern European tour operators:**
  - Deal with short breaks
  - No clear distinction between travel agent and tour operator

- Often coach tours or one-off excursions rather than back to back operations
- Smaller scale and scope
- Large/mass operators
- Vertically integrated
- Multinational
- Cover a wide range of destinations & tourism products
- Belong to Federation of Tour Operators (FTO)
- Attempt to achieve cost advantage/increase market share to turnover
- High volume - low profit margin strategy
- Small/specialist operators
- Provision of holidays for few destinations
- Often themed / activity holidays
- Belong to Association of Independent Tour Operators (AITO)
- Concentrate on differentiation & value added strategies
- Low volume - high profit margin strategy

ICTs in tour operators

- ICTs enable them to enhance productivity, improve their holiday-capacity management, reduce the labor cost of telephone operators and provide a better service to both agencies and consumers
- Tour operators establish electronic links with travel agencies, aiming to reduce their information handling costs and increase the speed of information transfer and retrieval
- Tour operators utilize market intelligence data arising from the systems
- The systems help monitor the booking progress and productivity of travel agencies

INTERNAL SYSTEMS & INTRANETS OF TOUR OPERATORS

Tour operator intranets:

An intranet is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network. Typically, an intranet includes connections through one or more gateway computers to the outside Internet. The main purpose of an intranet is to share company information and computing resources among employees. An intranet can also be used to facilitate working in groups and for teleconferences.

- Offer strategic & operational tools for internal efficiency
- Co-ordinate departments
- Have the ability to maximize the occupancy of pre-purchased inventory for profitability
- Enable management of allotment contracts or allocation to maximize yield
- Can monitor performance per travel agency, market segment, region, airport catchment, etc
- Have the ability to address problems systematically
- Support operational management in all resorts
- Enable co-ordination and exchange of timely information
- Support co-ordination with head office / different departments in organization
- Facilitate management of business functions

- Support staff recruitment on-line and assist training
- Enable control of internal resources

Tour operator extranets:

An extranet is a private network that uses Internet technology and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company's intranet that is extended to users outside the company. It has also been described as a "state of mind" in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers.

- Manage relationships with partners
- Are critical for the efficiency & effectiveness of entire value chain
- Have the ability to digitize all dealings with suppliers & customers
- Are critical for vertically integrated travel organizations
- Enable tour operators to make strategic decisions
- Can assist forecasting market trends
- Support the decision making process
- Extensible Markup Language (XML) and the Internet provides an opportunity to communicate across multiple channels using a common language which tour operators can benefit from

Connecting with all stakeholders through the Internet

- Tour operators use the Internet to:
  - Research destinations
  - Develop products online
  - Access information on local products
  - Design package tours
  - Provide better information for product managers & contracting employees
  - Enrich their products by offering a range of additional value added services
  - Understand the needs of their clients better
  - Alter elements of the marketing mix according to market conditions
  - Strengthen off-line and on-line marketing drive
  - Attract niche markets (skiing, diving, etc)
  - Enable smaller operators to develop differentiated products
  - Promote distressed inventory at the last minute
  - Expand operations globally
  - Reduce the costs involved in brochure printing & distribution
  - Replace traditional brochures by individualized virtual brochures

Disintermediation vs. Reinter mediation

Internet developments illustrate two major trends:

- Tour operators aim to disinter mediate travel agencies
- Tour operators are threatened with disintermediation

The root word intermediate means to act as a middle man or broker. The term disintermediation is used to refer to the partial or complete replacement of an intermediate or the function it

performs. An example of Disintermediation includes UWA direct services in which a tourist buys a gorilla permit directly from the UWA using the UWA website or UWA call centre. When this occurs, the tour operator is disinter-mediated and loses the commission the tourist would have paid had the tourist used a tour operator for booking.

The term Re-intermediation is used to refer to the process in which intermediaries that have been disinter-mediated first are reasserting their intermediary role. However, Re-intermediary is also used to describe the entrance of new intermediaries into the travel distribution system.

HOW ICT HAS LED TO DISINTERMEDIATION AND HOW THIS HAS IMPACTED THE TRAVEL INTERMEDIARIES

The introduction of the web browser into the market place has made communication between suppliers and consumers possible and the continuing evolution of IT has made a considerable impact on intermediaries (travel agencies and tour operators). The wide spread of public use of the web has created a number of conditions that have been game changer in both beneficial and detrimental ways to the modern travel agency. As a result, many travel agencies have had to make considerable adoptions to remain solvent.

Coordination

Improved communications technology has greatly widened the ways in which a travel agency can communicate not only with customers but also with business connections and partner service. High speed internet connections allow almost instant video, voice and text communication across the globe often at considerably less expense than traditional methods such as long distance telephony can offer. Data can be sent almost instantaneously from the agency to airline, hotel or other service, and then relayed to customers. This allows booking and coordination that might have taken hours or days to be processed almost instantly greatly reducing wait, time lost productivity.

Organization

The information age has brought considerable new benefits. Data can stored more quickly than in the past, which is attributed to high speed hardware and better software. Enterprise level software such as Unit 4 central command allows travel agencies specialized programmes dedicated exclusively to managing their businesses and organizing data. This allows agencies to run more efficiently, preventing productivity losses due to input time and other tedious tasks.

Self-service booking

One of the largest impacts on the travel agents or intermediaries has been to visit an agency; they can go online to companies such as Expedia or Priceline and book the entire trip themselves. Airlines and hotel themselves also have cut the travel agent all together by allowing customer to book tickets and lodging directly from their site. That’s an unpleasant circumstance for travel

agencies, who have traditionally relied on being seen as a necessary intermediary between the customers and the services they require.

Outlook

While adaptation to new technology has subjected the travel agency industry to growing pains, the industry is still sound primary focus for most agencies has been directed to online sales, allowing clients the ability to book their trips without the constraints of office hour or worrying about their own schedules. The traditional travel agency will doubtlessly see further evolution as technology continues to advance but as ling a demand for packaged travel remains, there will be place for travel agencies both online and offline.

Employment and Entrepreneurship

Internet intermediaries also stimulate employment and entrepreneurship by lowering the barriers to starting and operating small businesses and creating opportunities for long tail economic transactions to occur that were not previously possible, whereby businesses can sell a large number of unique items, each in relative small quantities. Internet intermediaries enable creativity and collaboration to flourish among individuals and enterprises and generate innovation. User empowerment and choice are considered very important and positive social side effects of the access to information that internet intermediaries provide, as well as improving purchasing power with downward pressure on prices. A critical role of internet intermediaries is to establish trust, including through protection of user privacy by enabling individuality and self-expression, they are also offer potential improvements to quality of societies in terms of fundamental values such as freedom and democracy.

Changing Markets

Despite pressure from third parties and companies selling their products on their own websites, the travel agency business is not dead nor in danger of dying. Travel agents or intermediaries are still responsible for all cruise bookings, package travel booking and airline travel bookings. Like many service industries, the travel agency business is evolving to adapt to new technology. Many agencies are shifting focus to online service for traditional services such as airline and hotel bookings, while maintaining some physical stores where business is sufficient to do so.

Brick and Mortar Agencies

As more people book online, fewer people are heading into brick and mortar agencies and dealing directly with an agent. Pressure has also mounted on traditional agencies as airlines, hotels and other service providers they previously represented offer their services directly to customers online, cutting out the agency and the commission. Travel agencies are essentially information brokerages that connect clients with services, these commissions are foundation basis of the agency's income and therefore many agencies have seen sharp income decline from

Types of online travel intermediaries that have developed as a result of IT

Online travel agencies (OTA) offer consumer a versatile experience. Not only can they show the multitude of travel options, but also offer trusted reviews and accurate local information. Online Travel Agencies have created their own brands that consumers trust and reorganize as thought leaders. Hoteliers leverage online Travel Agencies brand when they list their property with them. For example, lonely planet reviews each of their properties pricing and travelers know they are getting the best deal.

Opaque sites

An opaque inventory or site is the market of selling unsold travel inventory at a discounted price. The inventory is called "Opaque" because the specific supplier such as hotel, airline, etc remains hidden until after the purchase has been completed. This is done to prevent sales of unsold inventory from cannibalizing full-price retail sale. The main sources of Opaque inventories are Hotwire.com and priceline.com, but Travelocity.com and Expedia.com also offer Opaque booking options.

Group buying sites

Group buying, also known as collective buying offers products and services at significantly reduced prices on condition that a minimum number of buyers would make the purchase. Origins of group buying can be traced to china where buying was executed to get discount prices from retailer when a large group of people was willing to buy the same items. In recent times, group buying websites have emerged as a major player in online shopping business.

Metaserch engines (Aggregators)

A Metaserch engines (aggregator) is a search tool that uses another search engine's data to produce their own results from the internet. Metaserch engines ate input from a user simultaneously send out questions to third party search engines for result. Sufficient data is gathered, formatted by their ranks and presented to the users.

Information stored on the World Wide Web is constantly expanding making it increasingly impossible for a single search engine to index the entire web for resources. A Metaserch engine is a solution to overcome this limitation by combing multiple results from different search engines, a Metaserch engine is able to enhance the user's experience for retrieving information, as less effort is required in order to access more materials. A Metaserch engine is efficient and capable of generating large volume of data.

Product review sites

A review is an evaluation of a publication, services, or company such as a movie (a movie review), video game (game video review), musical composition (music review of a composition

or recording), book (book review), a piece of hardware like a car, home appliance, or computer, or an event or performance such as living music concert, play, musical theater show, dance show, or art exhibition. In addition to a critical evaluation, the review's author may assign the work a rating to indicate its relative merit. More loosely, an author may review current events, trends, or items in the new. A compilation of reviews may itself be called a review. The New York Review of Book for instance, is a collection of essays on literature, culture, and current affairs.

HOW TOUR OPERATORS CAN USE IT TO IMPROVE PRODUCTIVITY AND COMPETITIVENESS.

Productivity relates to the effective use of resources, and has a direct impact on competitiveness. Competitiveness relates to the effectiveness of an organization or tour operator in the marketplace relative to the other organization that offers similar products or services. Operations and marketing have a major impact on competitiveness.

Tour operators both design and package tours, which they sell through the travel distribution system, making them both suppliers and intermediaries.

Because of the bulk reservations, tour operators require access to GDSs to book tour components.

Third party and GDS venders offer tour operators software packages, which include package creation software systems to help in the distribution of packages, handle reservations and customer management.

Some operators also use spreadsheets, relational databases and financial packages to perform different functions.

Tour operators can specifically use IT in the following ways to improve productivity and competitiveness:

Package creation

The creation of a tour package involves the identification of travel products and their combination into a tour. IT can assist by facilitating negotiations with destination suppliers to reduce rates based on volume. Email, file transfer or videoconferencing make the negotiation process smoother and less costly, but must be combined with site visits for familiarity with the destination and its facilities.

Software venders provide solutions to create and distribute customized tour itineraries and package. The most sophisticated IT solutions include end-to-end tour management including itinerary creation, pricing, distribution, booking, supplier and customer documentation and profit and loss reports. Such software must cost the tour components and the entire tour, and do

sensitivity analysis. It must also handle the tour inventory, each tour itinerary, and group tour quotes for special groups.

Tour package distribution

Tour packages are marked using brochures or online media such as PDF documents or videos. Desktop publishing software can create hardcopy and electronic brochures. Software tools such as Microsoft Publisher are easy to use, and desktop publishing software such as Adobe photo shop and Adobe Illustrator are favored by graphic designers. Printed brochures are costly and therefore electronic documents and web content are more common.

Many tour operators place their invitatory on a GDS to facilitate bookings from wholesalers and travel retailers, or on the World Wide Web to distribute product information. More sophisticated websites include booking engines for travelers to book directly with the tour operator. Some operators use social media to promote new packages and build a more personal relationship with travelers. Through websites, operators can produce and share their video content.

Reservation and customer management

Tour operators need computers to handle reservations and payments at two levels:

i) To handle the outgoing reservations for tour components; and

ii) To handle incoming reservations from travelers for their tour packages. To make block reservations and payments with the component suppliers, a GDS terminal may be used, particularly for air reservations. Some GDSs provide Reverse Access, which allows the tour operator to retrieve flight information and availability and create PNRs and advance seat reservations.

Reservations for tour packages require an internal CRS, which can either be designed in-house or purchased from a third-party vender. This database contains information on tour availability, descriptions of tour itineraries and components, payment and booking deadlines, costs, travel agent commissions, credit card processing and customer profiles.

ONLINE BOOKING SYSTEMS

A **system** is an organized, purposeful structure that consists of interrelated and interdependent elements (components, entities, factors, members, parts etc.). These elements continually influence one another (directly or indirectly) to maintain their activity and the existence of the system, in order to achieve the goal of the system.

An **online booking system** is a software which allows a potential customer to book and pay for an activity or service through a website. Advanced booking systems also allow customers to book through social networks and even on their mobile phones, helping deliver bookings wherever customers happen to be.

The use of online booking systems has made it possible for us to easily check on the availability of vacant rooms in hotels or seats on flights. It has become much easier for travel companies and travel agents to come up with a tour inclusive of the wishes of the client, receive instant confirmations, as well as stay competitive.
Online booking systems are intended to help one search for and book travel tours via the Internet and effortlessly keep track of the status and progress of one's bookings.

How online booking system works

An online reservation and booking system exists entirely within your website, and requires no installation from your customer to continue with their purchase.

A customer will land on your website and choose which activity or service they'd like to book, and then will click through to the booking page. At this stage, the customer will fill in a booking form. Custom forms can also be set, allowing you to harvest whatever information you require in order to complete the booking.

The customer will then give their card details to pay through a secure payment gateway, and the payment will be transferred to you. This information is displayed in our secure Content Management System, which is only accessible via a login and password, offering greater security than competing booking methods.

Here is the standard algorithm for online hotel booking:

1. The client enters the online booking system website and reads through the booking rules;
2. Next, one picks a hotel and, having made sure there are vacant rooms available and filled in all the relevant fields in a form, sends one's order into the system by email;
3. The system automatically processes the order (except in non-standard cases) and sends a preliminary confirmation along with the terms and conditions of prepayment, and the client is placed on a waiting list;
4. Upon receipt of relevant guarantees from the client (a deposit, a letter of commitment, etc.), the agent makes a final confirmation of the booking;
5. A copy of the final confirmation is sent over to the hotel;
6. Then the booking information is entered into the occupancy schedule with a subsequent automatic change of the status of the hotel's room supply with the agent.

The advantages of booking hotels online include:

- Reduced number of man hours managing booking activity.
- Centralized customer data for easy customer management.
- Bookings can happen at any time, from anywhere in the world.
- Reduced customer service requirements.

- Instant payment, reducing the need to chase up on deposits or cheques.
- Effortless integration with social networks and with coupon websites.
- Bookings can be managed from a mobile device, perfect for small businesses
- Simplified booking procedure for customers.
- The client immediately receives a guarantee of check-in at the hotel's prices;
- The client can pick for oneself the length of stay, the room category, and a set of additional hotel services;
- There is no need for the hotel to get in touch with the client, since booking takes places automatically without administrator participation;
- The hotel establishes the size of quotes for rooms to be booked online, all the prices, and the availability of additional services;
- The system works autonomously around the clock 24 hours 7 days a week

Popular examples of online booking systems:

- www.booking.com (recommended to those who plan on booking hotels in Europe);
- www.agoda.ru (booking hotels in Asia);
- www.hotels-and-discounts.com (booking hotels in the US);

Booking travel tours online

The popularity of the Internet is leading to its wide use in tourist business. In addition to ordering airline and railway tickets and booking hotels all across the world, one can also pick a full-scale individual travel tour online. Computer booking systems used in developing tourist websites are distinguished not only by swiftness of performance but the ability to handle massive amounts of information for tourists. Tourists can enjoy the following advantages of using a system of this kind:

- There are lots of various getaway offers concentrated in one place;
- The availability of information - 24 hours a day;
- The ease of comparing offers and picking an optimum getaway offer;
- Accurate and swiftly updated information on the number of vacancies in resorts, hotels, tourist campsites, and sanitaria in any country or region of the world;
- It saves you time – the tourist does not have to waste time going to the travel firm and talking to managers. It is much more pleasant to do it in the comfort of family and friends;
- The client gets an opportunity to study additional portal sections ("customer reviews", "consultation", "forum", etc.), which can help one make up one‟s mind concerning one‟s choice, provide all the answers one may need, and dispel any doubts one may have;

- Booking via the Internet does not obligate the client in any way. It is a flexible and convenient instrument for communication. The client can get in touch with a travel agency manager and change the trips time and place.

Travel firms get the following advantages:

- There is less time needed to search for a suitable offer;
- The work of the manager gets optimized during the high tourist season;
- The opportunity to distinguish oneself, continue to be competitive with other travel firms, look more progressive, “advanced”, and dynamically developing.

Here is a standard algorithm for a travel agent booking an online tour:

I. Registering the new user;
II. Choosing the tour;
III. Booking the order;
IV. At this stage, once all the fields have been properly filled in, one has to press the “Recalculate” button. The system converts the amount into rubles. Then one presses the “Book” button. After that, the system comes up with a tracking number for the order. Using this number one can easily check on the status of the order and, if necessary, edit or unbook it.
V. Checking on the status of the order. In order to check the status of the order, one has to select “View the Order” and enter its number in the window. One will be presented with the latest information.

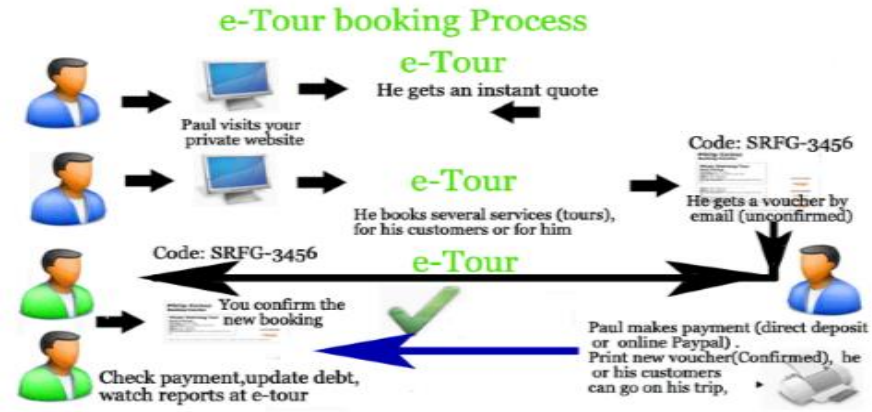

Figure 1. A diagram for the e-Tour booking process [2]

Other Online Systems:

Route Finding Systems

These give access to hi-tech navigation systems to locate places than using paper maps and penciled notes. Companies make use of the Global Positioning Satellite system to produce consumer-level navigation systems.

Route guidance started in the transport industry to help commercial drivers but now they are commonplace. Even GPS mobile phones can now be used as a navigation system with the right software. There are also many web-based services that offer route-guidance information.

Characteristics

- They can provide directions in graphical form / maps
- Text based directions can be produced
- Directions/maps can be printed and saved for later reference
- Zoom-in/out feature can be applied so that you can see different levels of detail
- Places of interest/ fuel stations/ hotels etc can be shown
- They can allow you to plot multiple destinations per journey - these are called 'way points'
- You can select road types you want to use e.g. motorways, 'A' roads etc
- Can select fastest/shortest routes
- User gives start place/postcode and the destination postcode
- Different routes may be offered

Advantages of route finding systems

- They are very fast and convenient compared to plotting a route with a paper map
- Map databases are updated frequently so more up-to-date than traditional maps. It s surprising how much the road network changes in just a few months.
- Directions can be printed so the car passenger can simply read out the instructions (driver should not try and read them on the move!
- Very useful for commercial drivers on an unfamiliar route who need to avoid obstacles such as low bridges, weight-limited bridges, narrow roads etc
- For long journeys, fuel stops can be planned in and printed along with the route instructions
- Time details of journey provided, helping with planned rest stops and letting people know roughly when you will arrive
- Distance details provided - helping estimate cost of the journey.

Disadvantages of route finding systems

- Need access to the internet for web-based guidance

- Need access to the right kind of mobile or navigation device for 'real-time' guidance
- The route may not be the best or even sensible, for instance choosing the 'shortest' route may take you through extremely difficult country lanes
- Many villages now have 'no sat-nav' signs to warn drivers that the road is not suitable even though the sat-nav tells you to use it. Many lorries get jammed trying to drive down narrow roads they were guided along
- The route may take you through residential streets, making it more unsafe for residents due to the extra satellite-guided traffic
- Cannot factor in delays such as temporary road works or diversions
- Maps need to be up-to-date

School Administration Systems

Any organization needs to have a system in place to store details of employees. This may be just a paper-based index card system to store their details or a full-scale database system.

Schools are particularly difficult because the school population is constantly changing, as young students arrive and older students move on.

The administration system need to keep track of thousands of changing details and must always be up to date.

Schools use a computerized database system to handle this task.

Characteristics

- The system must be able to store important details about each student
- The system manages records attendance and retrieves them automatically
- The system shows statistics of attendance of each student
- The system should be able to store details of every students' and teachers' timetable.
- The administration system should be able to record details of students' marks, perhaps from tests, projects, mock exams etc.

Time Tabling Systems

Time tables are used whenever something needs to happen at a certain time but with the additional complication that the timing of that event causes as few problems as possible for other things in the same time table.

Example: Travel time tables

Time tables are vital for Rail, Bus and Air travel. Once again, the time table needs to deal with the following

- Arrival times should ideally give passengers enough time to connect to another popular route for their onward journey. A poor time table would cause arrivals and departures to overlap.
- Popular journeys should have more trains \ buses \ planes
- Only one train \ bus \ plane can be at the terminal pick up point at any given time
- Coping with unforeseen delays and breakdowns.

Characteristics

- They must deal with many items in the time table
- They must deal with many constraints \ limits.
- They must be as problem-free as possible.

Characteristics

- Identifies starting station and terminating stations
- Allows through-journeys to be planned
- You can tell the system to include a specific station or to not use a certain station
- Shows a selection of possible journeys
- Tells you the next available train \ bus \ flight to your destination
- Allows for one-way and return journeys
- Provides exact dates and times of the outward journey including arrive-before times.
- Provides exact dates and time for the return journey
- Provides a code to identify each specific flight \ route to be used for the journey
- Allows you to select the class of the journey - first class, economy etc
- System provides a search facility
- Allows you to select a journey by price
- Print out the time table
- Allows you to store your most-used journeys to speed up booking it next time
- Tickets printed online to avoid queuing at the station \ terminal
- Email confirmation of booking

Stock control systems

- Stock costs money.
- So a business do not want to hold a huge amount of stock, but neither nor do they want to run out of stock, so losing business and annoying customers.

- The way this balance between too much and too little stock is handled is to make use of a stock control system
- A stock control system is a database application.
- There are many commercial stock control systems you can buy off the shelf.
- On the other hand if it needs to handle the stocks of a huge complicated company then they may invest in a bespoke database system.
- And if you only handle a few stock items, perhaps a simple hand-managed spreadsheet would be sufficient

Characteristics

- They are able to record how many of a particular item is in stock
- Have a record of when new orders of a specified product are due to be delivered
- Can be used to search for the details of the supplier e.g. name, address, phone number
- Used for Just in Time (JIT) ordering (items only ordered as they are needed)
- They can produce lists of products stocked and suppliers
- Hold minimum and maximum stock levels (can warn when minimum stock level reached)
- Automatic reordering when minimum stock level reached
- Automatic ordering can be overridden by staff if necessary

Customer Record Systems

Many businesses need to keep a record of their customers. They want to do perhaps because:

- They are repeat customers and the business wants to make it simple for that customer to place another order.
- Perhaps they offer product warranty and so need to keep track of past customers.
- Maybe they have a scheduled service arrangement for the customers' car \ boiler etc
- Payment is due at a later date and so it is vital to track the purchase order and invoice

Characteristics

- They store contact details of customers
- Have a unique ID for each customer
- Store orders with a unique number
- Store orders against customers
- Generate invoices /credit notes for orders
- Store customer payments against the customer and the invoice
- Produce customer statements and outstanding invoices
- Produce a list of products available

- Handle discounts and returns

Online Training Systems

An online training system allows a company to offer training at a time convenient to the customer or employee.

For instance many companies offer employees online training courses which they can undertake from their desk at work. Courses can be completed gradually over a number of sessions.

Characteristics

- A course can be linear i.e. section 1 is always followed by section 2. Or it can be non-linear, where the next section to be covered depends on the answers a student gives in the previous section.
- Video clips and multimedia clips help explain concepts, to demonstrate a feature or an action
- The course can be stopped and started to suit the learner. The package will remember where the student ended and return them to that point next time they log on
- Pace of learning set by the student. They can repeat an exercise until they are confident they have learned it.
- Can return to previous topics to reinforce any concepts not fully understood
- Tests and instant feedback for the student to know how they are getting on
- Trainer should be able to view a student's progress and assess if they need help
- The system should provide statistical information such as average scores etc
- If internet based then the course can be taken from anywhere at any time