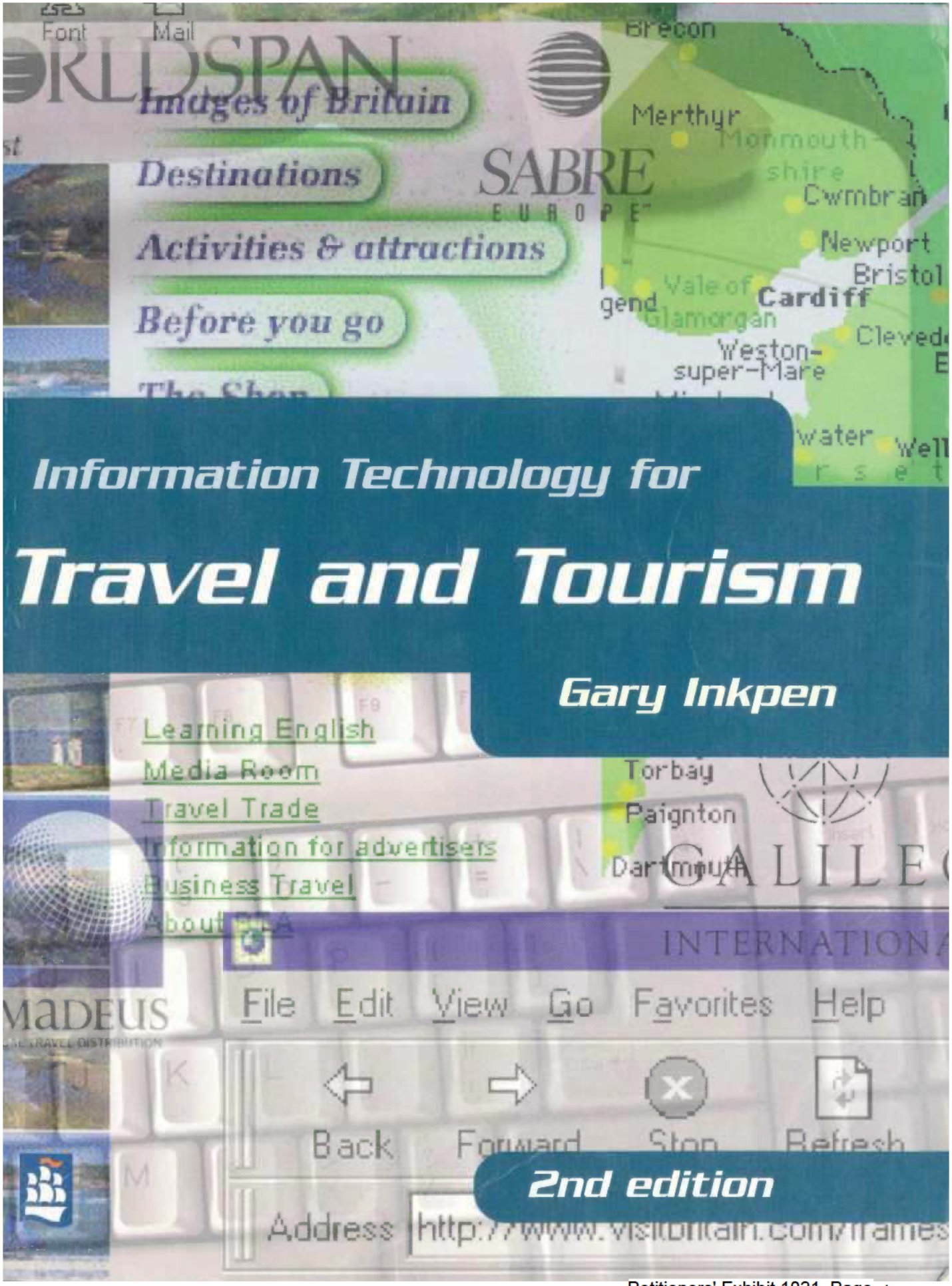
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2nd edition

NEIL CORBIERE

Information Technology for Travel and Tourism

Cameron Taylor

Information Technology for Travel and Tourism

SECOND EDITION

Gary Inkpen

LONGMAN

Information on the products and services presented in this book has been supplied by the companies concerned, and the author has made every effort to ensure that this material is accurate and is presented correctly. Most of the companies concerned have reviewed the text and have had an opportunity to modify the material written about them. It must also be stressed that the book does not represent any kind of survey of all available products on the market. The items that have been included are simply examples of systems available to travel agents in the UK at the time of writing.

It is for these reasons that the author and publisher cannot be held responsible for any errors or misrepresentations concerning the descriptions of products and services mentioned in this book. Products described here may have changed since they were originally documented; for up-to-date information and pricing details the reader is advised to contact any company in which they are interested directly.

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Contents

Preface

Although this book is called a new edition, in fact it more closely resembles a complete re-write; little of the first edition of *Information Technology for Travel and Tourism* has survived. The reason for this has been the rapid developments in the three key subject areas: travel, tourism and technology. For example, the Internet was not even mentioned in the first edition, yet here it has a chapter all of its own. Also, the term 'disintermediation' was hardly talked about back in the early 1990s, whereas in this edition it is a thread which runs throughout the entire text. As a result of some excellent feedback, the new edition has also been expanded in scope. It therefore now includes material on tourism, and has a greater emphasis on hospitality related technology and the strategic use of IT within travel and tourism.

No doubt the reader of this second edition will detect some recent travel-related technologies which are not discussed. I'm afraid that this is unavoidable, given the nature of the subject; new technologies and industry developments are constantly being introduced. However, I believe that much of the information contained in the book will remain relevant and pertinent to your chosen study areas – at least until the next edition arrives!

The book is written primarily for those studying an undergraduate course in travel, tourism or some other leisure-related subject. It could also be of interest to post-graduates and students of other courses who are interested in how IT can be applied within a specific industry. In addition to its academic readership, it would also allow practitioners in the industry to gain an overall understanding of the technologies used to support travel and tourism. In particular it would be an effective way for someone working in one sector of the industry to learn about how IT is used in another sector, outside of their own. Ideally, the book should be read cover-to-cover if a good understanding of the subject is to be gained. However, it could equally well be used as a source of reference material for specific course topics, and I have included a comprehensive index to support this.

I have to admit that the book is written from a UK perspective. Having said this, many of the systems and technologies described in the book are becoming increasingly global in nature. For example, at least one of the four main global distribution systems (GDSs) included in the book (Amadeus, Galileo, Sabre and Worldspan) should be applicable in most countries of the world. Wherever possible I have tried to include systems which have either been developed in other countries or which have global applicability (e.g. the Australian ETAS system, Ireland's Gulliver and the travel agents' Voyager system which is also distributed in the Asia–Pacific region). Other deployments of technologies such as the UK's BSP exist in a similar form in other countries. So, for these reasons, I hope the book will be useful to students in other countries and international educational establishments.

The book is organized around my view of the industry's structure, which I have shown pictorially in Figure 1.1 (page 3). This sets the scene for the text by positioning within the supply chain the regulatory bodies, travel suppliers, intermediaries, delivery mechanisms and different types of consumer. The book therefore progresses from a

general description of the industry, through tourism and, via travel supplier systems, into the Internet and other means of distribution. It finishes up with an analysis of travel agency systems. A chapter summary is as follows:

- **Chapter 1** – I think one of the least understood areas, from the viewpoint of both the technological and business sectors, is the structure of the industry. In the first chapter I have therefore tried to set the scene for the remainder of the book by creating a structure within which the new technology fits. This chapter also includes some information on the leading standards' bodies and other travel organizations which are so essential to the successful development, direction and application of new technologies in travel and tourism.
- **Chapter 2** – This is a completely new chapter which specifically addresses how technology has been successfully applied by tourist offices and destination service organizations. This is a rapidly developing area and I have used the experiences of the British Tourist Authority and the Irish Tourist Board to illustrate how the innovative use of IT can make destination service organizations more effective, support the promotion of in-bound tourism and help travellers plan their trips better.
- **Chapter 3** – In my view it is essential to understand how the suppliers of travel products and services have used technology for their own in-house automation purposes, before evaluating the more challenging topic of distribution. So, this chapter focuses on the various technologies which different suppliers in each of the major areas have used. Where relevant, I have provided some limited historical background.
- **Chapter 4** – This chapter analyses the world's major travel distribution systems, which in the main are the GDSs. However, many other types of distribution system are also discussed, including HDSs (hotel distribution systems) and CRSs (central reservation systems). I begin my exploration of the marketing aspects of distribution technologies at the end of this chapter, with an analysis of marketing on the GDSs.
- **Chapter 5** – I hope you will agree that the Internet deserves a chapter of its own. It has had a profound impact on the travel and tourism markets already and is set to further revolutionize travel and tourism distribution in the future. So, I start this chapter with a general discussion of Internet marketing, sectoral disintermediation and other Internet-related issues. I then explore some leading new intermediaries such as Expedia and Travelweb before analysing several innovative supplier Web sites including British Midland and Marriott. Finally, I investigate how the Internet is being used to support destination service organizations in the context of tourism by looking at the VisitBritain site and the revamped Gulliver.
- **Chapter 6** – This chapter examines the various communications technologies, other than the Internet, which are used to distribute travel and tourism information to end users. It covers video-conferencing, EDI, e-mail, teletext, videotex and value-added network services such as those run by Imminus and AT&T.
- **Chapter 7** – This chapter actually bears a passing resemblance to material in the first edition! Basic terminology is defined, including such terms as back-office systems, the front office, accounting, consumer marketing for travel and MIS. However, it has been completely updated to include a new POS technology (such as software robots and point-of-sale assistants), the latest changes to the UK's BSP, and examples of four travel agency system products.

It is always difficult to achieve a good balance between quantitative definitions of what certain technologies are and how they work, and the more qualitative discussions concerning issues and strategies. In this context, I have tried to focus on how the new technologies are being deployed rather than describe the intricacies of how they work. When considering new technologies such as the Internet I have included discussion of the major issues and the factors which may influence their future directions. I think this should help lecturers and other thought-leaders to set the scene for

further in-depth debate on subjects related to technology in travel and tourism.

Finally, I would like to thank my family, friends, publisher and business colleagues (see long list of acknowledgements!) for their help and support. Without them I would not have been able to write this book. I hope you enjoy it and that it helps to stimulate new and innovative ways of using IT within the world of travel and tourism.

Gary Inkpen
Hove, March 1998

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It would not have been possible for me to write this book without the participation of some leading industry figures. These individuals gave me their time, their views and some very interesting material. I would therefore like to publicly acknowledge and thank the following people for their help:

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1

The travel and tourism environment

This chapter discusses the structure of the travel and tourism industry and the regulatory framework in which it operates. Although the focus is very much on the UK, I have also included some examples of overseas organizations. In many countries, the trade and industry structures and bodies are similar to the UK.

Introduction

People travel for many reasons. Some need to travel for business purposes, some for leisure or recreational purposes. But whatever the reason for travelling, people are doing more of it now than they ever used to and what is more, the trend is upwards yet further. Future growth is due to socioeconomic reasons including more leisure time, increased levels of disposable income, the globalization of business and the natural attraction of travelling around the world to see new sites or visit old friends in far away places.

If you want tangible evidence of our desire to travel then just ask any person in one of the following situations: a big lottery winner, a student who has just finished a degree course, someone who is about to retire from work or a businessperson who needs to export a product in order to expand the company. They will all invariably include travel in their plans. So, it's a big and fast growing industry and one in which a large amount of effort goes into making those travel plans; and plans are generated from the communication of information. Travel and tourism is therefore an information business. A business in which access to up-to-date information on an extremely wide range of topics is required instantly.

Now, if you put this highly visible, rapidly growing and complex activity into the context of rapid change in distribution channels caused largely by technology, then you have an interesting story. A story that in many ways has been told by technological innovation in the way information is accessed and used by travel suppliers. From the use of computers by airlines to automate the booking of seat sales in the 1950s to the travel agency use of personal computers (PCs) linked to those airline systems in the 1990s, the change has been dramatic: and today, we are at the beginning of an even more revolutionary era that could see the boundaries of the booking process pushed right out to the travellers themselves via the latest Information technology (IT) paradigm, the Internet.

The Internet is both an opportunity and a threat. It is an opportunity for people to use technology to make travel planning and execution easier and more informed. However, it is a threat to intermediaries such as travel agents and tour operators. It's a big subject, the Internet, and I'll discuss it in more detail later in the forthcoming chapters. For the moment though, it is sufficient to say that the Internet is one of the most powerful movers and shapers of the travel and tourism industry both at the present time and, no doubt, in the future.

However, before we dive into some of the issues that surround IT in travel and tourism, I would like to spend a few pages and a little of your time discussing the environment in which the business operates. It is essential that you understand who

the key players are, what the current distribution channels are and how the whole lot is regulated by government and trade bodies. Although it may sound boring, the legal and regulatory aspects of the industry are key to how IT is used to support it. Only by gaining a clear understanding of the industry's structure and the environment in which it exists can you hope to gain a clear perception of the pivotal role that IT has to play within the field of travel and tourism.

The industry players

I think a vital first step in gaining an insight into IT for travel and tourism is to understand the overall structure of the industry: the supply-side travel companies, the types of demand-side consumers and the distribution channels that support it all. Figure 1.1 shows the major structural elements of the travel and tourism industry, as I see it from an IT perspective. The architecture of this diagram is important and I need to define the major elements in greater depth, chiefly because I have structured a large portion of the book around it! So, let's examine each of the players in a little more detail.

GOVERNMENTS

Governments have two main areas of influence within the field of travel and tourism. First, they set the regulatory structure of the industry and, second, they promote inbound tourism to their areas as a means of growing the local economy; and this applies at all levels of government: at the trading block level (e.g. the European Community), at the national level and at the local government level.

- **Regulatory structure** Much of the regulatory structure within which travel and tourism operates, is set by governments at the trading block and national levels. A primary role of most governments is to protect the citizens of its country by setting the ground rules for the travel and tourism businesses. Although such regulations are usually focused on controlling the safety of travel and protecting the commercial interests of travellers, they often have a significant impact on how technology is used within the industry. Most of us have heard of the data protection act; well this is just one example. I'll discuss this act and other regulations that have an impact on IT in more detail in the latter part of this chapter.
- **Tourist authorities** Governments at virtually all levels have an interest in promoting inbound tourism. This is because tourism is a powerful factor in developing and growing an economy. It is a means of bringing foreign currency into an area, supporting and growing infrastructure, strengthening national suppliers and boosting local trade. There are many ways in which governments can encourage the growth of tourism and besides advertising and promotion, one of the most cost effective means is the use of modern technology. Applications of IT in tourism are covered in more detail in Chapter 2.

SUPPLIERS

Travel suppliers provide the actual services required by individuals and groups as they move around the globe. Examples of these suppliers include transportation companies, sightseeing services and accommodation properties; but there are many other variations. Each travel supplier company will invariably operate its own technology: firstly, to automate its in-house operations and, secondly, to use this as a platform for distributing its product to retailers and consumers. It is the precise way in which these systems are made available to end users, whether they be individual travel consumers or travel agents, that is at the very heart of IT in travel and tourism. Consequently Chapter 3, which examines this topic in detail, covers a great deal of ground.

GDSs

Global distribution systems (GDSs) distribute reservation and information services to sales outlets around the world. Incidentally, in my terminology, a computerized reservation system (CRS) is used solely by an airline or a hotel chain and is quite different from a GDS, which distributes more than one CRS to users who are usually travel agents. However, more of that in Chapter 3, which deals

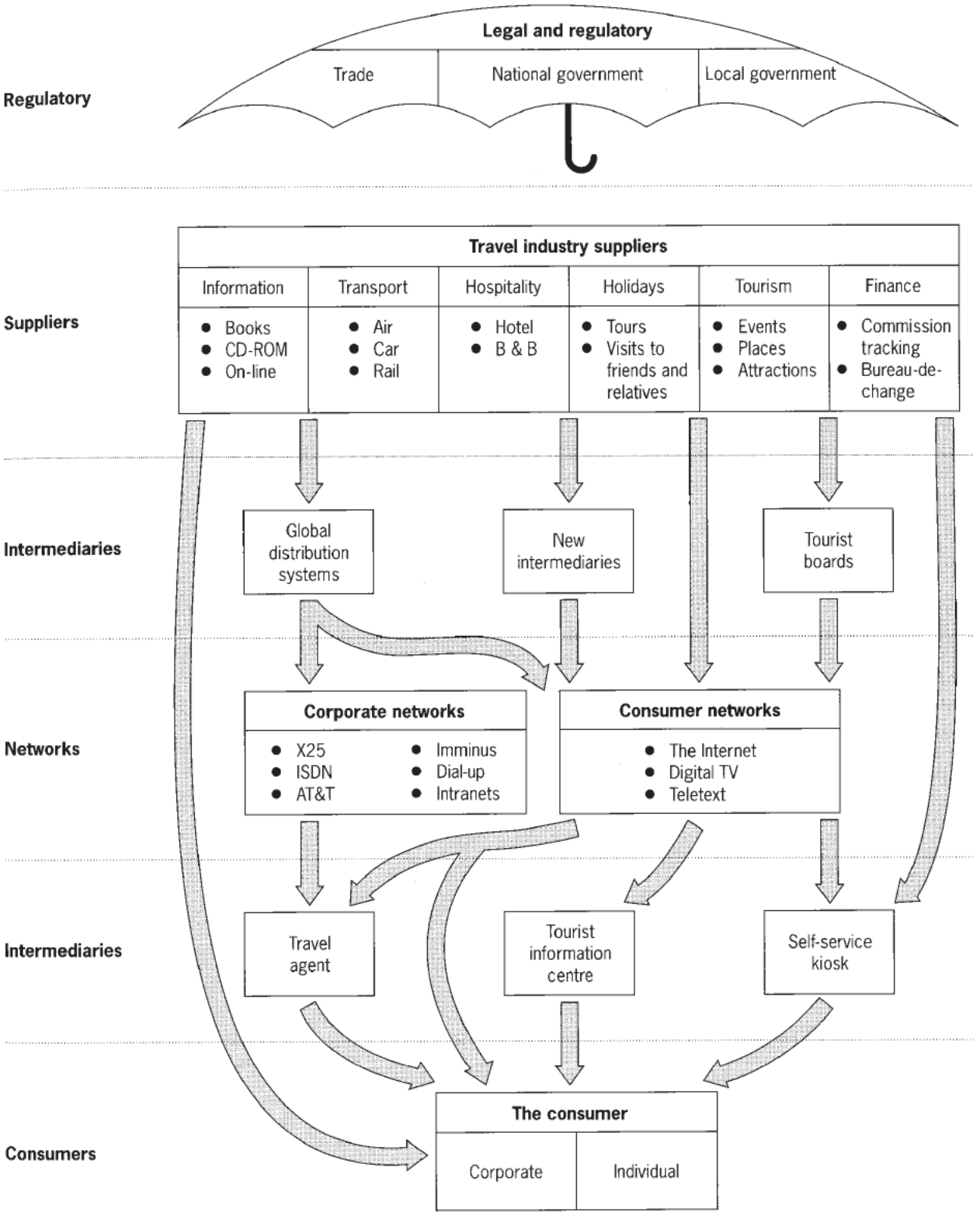


Figure 1.1 The structure of IT in travel and tourism

with suppliers. GDSs are companies that are invariably owned by groups of travel suppliers, each of which shares a common business interest. The principal GDSs are owned by airlines, although there are also a few that focus entirely on distributing hotel booking facilities and these are known as hotel distribution systems (HDSs). GDSs and HDSs provide their users with links to many types of travel supplier and travel-related services. At present the GDSs distribute their reservations and information systems to travel agents, using a variety of computer and telecommunications technologies. However, as we shall see later, this infrastructure is shifting rapidly and both the means of distribution and the ultimate end users are changing very rapidly.

RETAIL OUTLETS

The retail outlet, in terms of the travel industry, is where the rubber meets the road. It's where the consumer physically comes face-to-face with a seller or purveyor of travel products and services. Although some suppliers operate their own direct customer retail locations in city high streets, the majority of face-to-face selling outlets fall into two broad categories: travel agents and tourist offices.

- **Travel agents** Travel agents are the intermediaries between the travel suppliers and the travel consumers. They position themselves as experts on a wide range of travel service companies and areas of the world. They give advice to travel consumers on, for example, where are the best places to go on holiday, what are the best travel suppliers for an individual's specific needs and how airlines and hotels can best meet the needs of business travellers. Travel agents derive their income largely from commissions paid by the travel suppliers. So, travel agents use IT for two main purposes: (a) to access travel supplier systems for their customers, and (b) to automate in-house operations, thus minimizing costs in a low margin business.
- **Tourist offices** There are two main types of tourist organizations: public and private. The public organizations usually concentrate on promoting a country or region to the general public and other interested parties. Their principal objective is to encourage inbound visitors to their area. Private organizations, by contrast, are often the owners of attractions such as theme parks and their focus is on persuading people to visit them. This whole area is covered in more detail in Chapter 2. Both types of tourism organization are nowadays heavily reliant on IT. For example, they rely on large data bases of factual information and communication networks to disseminate the information to their customers that are invariably actual or potential tourists; and increasingly, self-service kiosks are being used to interface these information sources with people.

CONSUMERS

These are the individual travellers like you and me. These travellers may be travelling for leisure purposes, i.e. going on holiday, they may be travelling on business for their employer or they may simply be travelling to visit a location for some other purpose, e.g. to visit friends and/or relatives. Travel consumers may either: (a) purchase their travel arrangements from travel agents, or (b) obtain them direct from travel suppliers. Likewise, they may obtain their advice from tourist organizations or from travel agents; and increasingly these days, they may obtain both travel advice and booking services via the Internet. There are many related issues here and these are discussed in more detail in Chapter 5.

Types of travel and tourism

There are two main types of travel and tourism that are worth exploring and defining, if only so that we can all use some common terminology throughout the remainder of the book. These distinctions in the types of travel are important because each is often supported by a different type of technology. The two main types are leisure travel and business travel.

LEISURE TRAVEL

Leisure travel is the term used to describe the type of travel undertaken by an individual either

on holiday or at least, travelling for pleasure. A category known as visits to friends and relatives (VFR), is playing an ever increasing role in leisure travel. The main leisure product is, however, the packaged holiday that is assembled and marketed by specialist tour operators. However, the product range is vast and covers anything a personal traveller might demand of a travel agent. Leisure travel is remarkably different from business travel in many ways and so is the technology used to support it. Generally speaking leisure travel is less automated than business travel although, as we shall see during the course of this book, the situation is changing rapidly. The main characteristics of leisure travel are as follows:

- Lower transaction volumes.
- Highly seasonal.
- Personal customer contact.
- Higher margins.
- Wide product range.
- More complex bookings.
- Variety of bookings.
- Positive cash flow.
- Late booking trend.
- Brochure racking is key.
- Multiple payments from customers.
- Timetable controlled booking process.
- Long booking period prior to departure.
- High-street location is key.
- Unsophisticated travellers as customers.
- Long booking time.

BUSINESS TRAVEL

Business travel is the provision of travel products and services to companies. The individual employees of these companies travel as part of their jobs; jobs like sales representatives, mining and exploration engineers, buyers and senior management. The main products sold by business travel agents to companies are airline tickets, hotel arrangements and car hire. There are some important characteristics of business travel that have a bearing on the technologies used to support it, for example:

- High volume of air sales.
- Low margin.
- Remote customer contact.
- Highly automated.
- High pressure.
- Travel policy.
- Management information.
- Repetitive itineraries.
- Negative cash flow.
- Step function growth.
- Price sensitive.
- Sophisticated travellers as customers.

You may also have heard of a market known as 'travel and entertainment'. This is really another term for business travel but includes company expenditure; including, for instance, fuel on company cars, business entertainment expenses and meals incurred while away on business. The T&E market, as it is known, is alone worth approximately £18 billion in the UK.

PAYMENT AND FUNDING

As with any business, the way in which the customer pays is very significant; and nowhere is this more so than in travel. Leisure travel is more straightforward in that the payment methods follow similar lines as used throughout the retail sector. However, business travel uses one or two special instruments of its own.

The classic method is for the agent to send the customer an invoice and a monthly statement that is eventually paid. However, what does 'eventually' mean? It usually means that the travel agent will not be paid for at least one month. Well, with a reasonable size company with staff who travel extensively, the resulting negative cash flow is therefore a major problem for the agent. If the outstanding balance is not monitored carefully, then the funding costs can become prohibitive for the agent.

Also, from the customer's viewpoint, i.e. the company that employs the business traveller, it is often necessary to provide a cash advance for each trip. This is needed to cover local miscellaneous expenses such as taxis, tips and snacks.

The T&E market has therefore been identified as a prime target for the major credit and charge card companies. These card issuers see an opportunity to sell their cards to companies as a solution to the agents billing problems and as a means of channelling a lot more spending onto their cards.

They therefore developed card products especially for this area. For example:

- **Corporate card** A plastic card that is carried by individuals who travel on business or who at least incur business expenses. The plastic card may be either a credit card or a charge card. A credit card gives the holder the option of spreading the payments for billed amounts over a period of several months (with the application of an interest charge). By contrast, a charge card stipulates that the entire month's billings must be paid in full, with nothing carried forward to the next month (otherwise a penalty fee is imposed).

  The card fees for a corporate card are settled by the company who also often guarantees liability for expenditure, to the card issuing company. There are several ways in which companies can be billed for expenditure on the card including, for example: (i) central billing to an accounting department, or (ii) individual billing to cardholders themselves.
- **Lodge card** A credit or charge card for which only a single card is issued and is held in the company's safe. It is used for charging all centrally controlled expenses. For example, air tickets and rail tickets. At the end of each month all transactions for all employees are included on a statement that is sent to the central administration department within the company.

  This statement often contains a great deal of management information that is needed for control and reconciliation purposes. The lodge card statement is therefore a powerful source of management information that is collected by a form of partnership between the card issuing company, supplier systems and an associated travel agent. Some of these lodge card products are now quite sophisticated and even offer the option of management information on magnetic media, i.e. either disk, tape or via data transmission.

BUREAU-DE-CHANGE

The currency services business, which I have entitled bureau-de-change, is not undertaken by the vast majority of travel agents. In fact, outside of the major multiples probably less than 1 per cent operate their own bureau-de-change. The reason I have included this aspect of the business is that: (a) it is an integral part of the services that a traveller expects, and (b) I feel sure that the current lack of support in this area is set to change thus allowing far more travel agents to provide such a service in the future.

The bureau-de-change business revolves around the buying and selling of foreign currency and travellers' cheques. One of the key determinants of profit in this business is the rate used to exchange one currency for another. The aim is to buy at a high rate and sell at a low rate thus making a profit on what is called the spread of the exchange rate. Another good source of profit is the commissions charged on each transaction. The characteristics of this business are as follows:

- Highly seasonal.
- High volume.
- Low margin.
- Sensitive to exchange rates.
- Lengthy end of day balancing tasks.
- Risk of fraud.
- Slightly impersonal service.

Legal and regulatory

Many parts of the travel and tourism industry are regulated by government departments. Governments in this context refer to trading blocks, national governments and local governments. Each sets and enforces its own rules and regulations that have a direct bearing on travel and tourism.

THE EUROPEAN COMMUNITY

The European Commission, an integral part of the EC has a number of regulatory bodies, the lead one of which is called the European Civil Aviation Conference (ECAC). ECAC is in the process of implementing an 'open skies' policy for its member countries. This is equivalent to the deregulation that was introduced in the USA in 1978. The deregulation or liberalization of the airline industry is causing a great deal of change within Europe and is opening up new aspects of competition among airlines operating in the area.

One of the areas that is being opened up or liberalized is the airline fare setting process. It used to be the case that airline fares did not change very much. So in the fairly recent past, when an airline wanted to change a fare or introduce a new one, it would apply to its civil aviation authority (CAA), for approval. The CAA would liaise with its counterpart in the other country involved on the route for which the fare applied and after about five days or more, respond to the requesting airline who would then be free to introduce the new fare. All that has *changed* with the introduction of the first phases of the open skies policy. A new fare can now be filed with the appropriate regulatory body and seats can be sold using that new fare within a period of 24 hours.

What makes this more difficult to handle is the complexity of the fare structures and the widespread use of CRSs by travel agents. A fare is not just a price. It comprises two main parts: (i) a standard fare definition which is known as IFARES; and (ii) the various rules, i.e. up to 30 paragraphs of complex text, that govern the application of the fare as expressed in a standard format known as 'Resolution 100'. In Europe, over 75 per cent of airline reservations originate from CRS terminals (in the USA this figure is around the 98 per cent level). So, with a large number of fare changes coupled with the need by airlines to distribute their fares to each of the worlds major CRSs, one can appreciate the enormous volumes of information and the demands for extremely fast response times to changes.

This means that the marketing activities of airlines are now far more competitive than they used to be with the result that there has been a significant downward pressure on prices. This is good news for the consumer, but puts a lot more pressure on the airlines. This is in fact an area where IT has an increasingly important part to play. I will be discussing some of the IT-based products that support this activity in Chapter 3.

Finally there is the CRS code of conduct, which the EC aims to issue in the near future (see the section later in this chapter for a more detailed discussion of the ECAC code of conduct). This code of conduct will set out some rules of the game in terms of how CRSs and GDSs can operate across national boundaries. One of the guiding principals is reciprocity. This means that if, for example, the semi-autonomous business research environment (Sabre) provides access to the reservation system of say Air France in the USA, then Amadeus should provide access to the reservation system of American Airlines in France. This example illustrates reciprocity using two airlines that are almost national carriers. In such cases reciprocity is not usually an issue. But it does become an issue if a smaller airline is involved, say a domestic carrier in France that wants its flights to be bookable via a dominant USA GDS. The code of conduct is really aimed to protect these small airlines against the power of the CRSs and GDSs that are controlled by the global airlines.

GDS AND CRS REGULATORY ISSUES

A fundamental question that you may be asking yourselves is: 'Why do the airlines pool their reservation systems whereas other travel principals like the tour operators for instance, do not?' Why is it that when booking a flight the agent can access just one system that shows the availability of virtually all other airlines operating flights on the route in question? When booking a package each operator's system must be accessed separately in turn in order to compare products and prices. What makes airlines different in this context? Well, the answer is that the airlines are regulated and the other travel principals are not (also see the section on regulatory bodies in this chapter).

As a direct result of this regulation, CRSs are required to show unbiased displays of all airline's flights. In other words an airline's CRS cannot be used to discriminate against other airlines. To help you understand this better, let me first describe what a biased display consists of. A biased display is one that is displayed at the time that the travel agent is making the decision about which airline will be used for a customer's itinerary. The display that helps the agent do this is the availability display. An availability display is really how the airline CRS answers the question: 'What flights are available between City 1 and City 2 on a specified date?' It is highly likely that there will in fact be several flights operating between the two cities on the date specified and therefore the CRS will need to display a list of these flights. If the

CRS is biased then the display will show the host airline flights first and all those of its competitors next or even on a separate screen so that if the agent wants to view these then an additional entry must be made. Humans, being what they are, i.e. lazy, the flights further down the list will not be looked at so frequently and as for making a separate inquiry entry, forget it. So the travel agent's choice is biased in favour of the host airline.

Some of you may think that is fair enough. However, the European Commission would not agree. It would say that a large airline can use its very size to squash its competitors who are not able to compete on equal terms. Smaller airlines cannot afford to develop and run their own reservation systems on a par with the mega carriers. While they may run their own computer systems and even their own reservation systems, they cannot expect to achieve the same level of penetration of the travel agency network as a large national airline. They are forced to either load their inventory of flights into the large airline CRSs or to establish on-line links to these CRSs. If the large airline CRSs then bias the availability displays against them then they stand little chance of fair competition, which is not good for the consumer. So the European Commission stipulates that airline displays must be neutral in the way in which they display availability lists. To achieve this, the large airline CRSs show their availability in a sequence that puts the flights in an order on the screen that is based firstly on those flights with the nearest departure time to that required by the customer. Outside of this parameter, the sequence of flights displayed is random. It is also important to emphasize that the unbiased display regulations apply only to the first availability screen shown. Other follow-on screens that form part of the same booking may be as biased as the airline feels is appropriate.

The issues of bias and unfair practices have been debated by the European Commission for some time now. Guidelines were originally published in December 1992 and the Commission is still awaiting ministerial approval as at the time of writing in mid-1993. The new codes of conduct were due to have been implemented on 1 January 1993 but a decision is awaited from Brussels. This lack of progress has, however, not stopped American Airlines from raising the issue of domestic unfair practices in Spain and France where it is contended that Amadeus discriminates unfairly against Sabre. However, it appears that there is agreement on many areas of discriminatory practice and it is only a matter of time before a workable code is in force.

Incidentally, one aspect of this code that I haven't mentioned so far is the rules governing the purchase of PCs from CRSs. It used to be the case that a CRS could demand that a travel agent purchase the reservations PC from them. Not so any more. The new EC rules are expected to outlaw this as a kind of restrictive practice. Travel agents will therefore be free to purchase their PC equipment from a supplier of their choice and use it along with software provided by the CRS for reservation purposes. It will, however, be incumbent on the travel agent to ensure that the specification of the PC meets the minimum guidelines set by the CRS for successful access to their system.

In the USA a similar situation exists and the US Department of Transport regulates CRSs to ensure they are unbiased. In fact the USA is ahead of the EC in this respect because the US Department of Transportation concluded its long-awaited guidelines on a code of practice aimed at eliminating anti-competitive activities, at the end of 1992. So if airlines are unable to use their availability displays to win business from their competitors, then how can they use this massive investment in technology to their maximum advantage? The answer is that they try to make their systems the very best in terms of functionality. So in the USA, although an agent can book a flight in American Airlines' Sabre CRS just as easily as in United Airlines' Apollo system with neither system showing any bias one way or the other, each airline will argue that the features of its system make it superior to the other. Therefore, the final question: 'If the CRS displays are unbiased then why should an airline care how many agents are connected to its system?' It seems the answer to this is that there is evidence to prove that if an agent is using the CRS of a particular airline then the agent will sell more seats on that airline. This is probably due to the fact that there are many routes where unbiased displays are irrelevant and where the

agent will more naturally choose the flight on the display than any other.

The (ECAC) code of conduct for CRSs and GDSs

One of the most significant accomplishments of the European Civil Aviation Conference (ECAC) has been the adoption by its members of a code of conduct for CRSs in Europe. Incidentally, the term CRS, besides referring to an airlines computer system also embraces what we now call GDSs. In this section, I have used the term CRS because that is the terminology in which the regulation was originally couched. Once ratified by the European Commission's council of transport ministers, this code becomes the official policy of the European Community. ECAC recognizes that CRSs are becoming extremely sophisticated with the advance of new technology. Increased sophistication can, however, also bring with it problems: problems of distortion of competition between airlines; problems of fair treatment for travel agents; and, most importantly, problems for the consumers of air transport, who after all are what the aviation system is all about. They are entitled to be given the best quality information from which to make their travel choices. The dangers of excessive powers in the hands of owners of mega-CRSs, such as those operational in the USA and Europe, must be guarded against. Also, the negative aspects of bias and unfairness need to be discouraged actively. Conscious of these various problems, ECAC decided in April 1987 to embark on the preparation of a code of conduct that would govern the operation of CRSs in Europe.

The UK (CAA)

The Civil Aviation Authority (CAA) is a UK Government department that regulates airline activities to, from and within the UK. It negotiates with other foreign governments in order to agree how routes between the two countries are to be shared by their airlines. This is more complicated than it perhaps at first sounds. Take for instance flights between the USA and the UK. First of all there are several UK airlines that are represented by the UK Government, which itself no longer owns an airline as it once did with British Airways. The UK Government's objective is to negotiate the maximum number of flights that UK airlines can operate to USA gateway cities. A gateway city is a major airport that feeds a large geographic region of the USA.

So, the CAA might, for example, wish to have say four flights each day to New York, which is a principal USA gateway. But the US Department of Transportation (the USA equivalent of the CAA) might want its airlines that fly to the UK to have six flights from London Heathrow to New York Kennedy airport. First of all there is the need to agree on the number of flights, then there is the need to agree on the departure times of the flights granted to the UK and USA airlines and then finally when this has been agreed the CAA has to decide which UK airline is to be allocated which flight and from which airport. With the CAA negotiating with each country that has one or more airlines that fly into the UK, you can probably imagine the size and complexity of the task.

All I have talked about so far is flights between the major gateway cities of each country. There is, however, another dimension that addresses the flights within a country. At present non-UK domestic airlines are not permitted by the CAA to operate flights between cities in the UK. This seems fair enough, after all UK airlines are not allowed to operate between cities in the USA, for example. This whole subject is known as 'cabotage'. But if airlines are truly to compete with each other then why shouldn't BA, for example, operate flights between Paris and Nice and why not in turn allow Air France to operate UK domestic flights between London and Glasgow? This environment is known as true cabotage and is something that the European Commission is planning to implement.

Trade bodies

In addition to the regulatory activities undertaken by the UK Government and the European Commission, there are several important trade bodies or associations that play crucial roles in the orderly development of technology within the travel business. While it is not possible to cover all of these in depth, I have selected the following organizations for further exploration because they appear

to be relevant to the use of information technology in travel and tourism in particular:

- **ABTECH** The Association of British Travel Agents (ABTA), is the principal trade body for UK agencies in general. ABTECH is a technology sub-group within ABTA that provides help and guidance on technology matters to UK travel agents.
- **IATA** The International Airline Transportation Association provides a single point of contact to the trade on behalf of all the world's airlines. For travel agents with a high volume of air ticket sales, a licence from IATA is essential if tickets are to be produced in-house.
- **TTI** The Travel Technology Initiative is a group with a diverse membership of travel suppliers, system companies and agents whose principle aim is the standardization of computer booking and ticketing systems.
- **HEDNA** The Hotels Electronic Distribution Network Association is a world-wide group whose members are mainly hotels. The aim is to encourage the development of electronic bookings for members via several distribution networks.
- **GBTA** The Guild of British Travel Agents has a membership of agents with a high concentration of business travel. The GBTA has its own technology experts and works with leading system suppliers to foster products that benefit its members.
- **GEBTA** The Guild of European Business Travel Agents is, as the name implies, a European-wide version of the GBTA.
- **NAITA** The National Association of Independent Travel Agents has members from among the smaller high street agencies in the UK.
- **IFITT** The International Federation of Information Technology and Tourism arranges the annual ENTER conference that addresses key issues in the field of travel and tourism.

In the following paragraphs I will give you a brief overview of these organizations. For further information you may wish to approach them directly and I have therefore included their contact details in the Appendix. Some of the other organizations that I have not been able to cover in depth include the Institute of Travel and Tourism, which although primarily concerned with training programmes, launched a quality initiative in 1997 aimed at travel system suppliers. Then there is the World Travel and Tourism Council that does much to stimulate travel and tourism at a global level and may in the future initiate IT-oriented initiatives.

ABTA's ABTECH

ABTECH is a UK-based independent technology advisory service for ABTA members and others. ABTA is the UK's trade body for travel agents and tour operators. It was formed in 1950 with just 100 members and in 1955 became a company limited by guarantee. Today it has a membership of 3,000 with over 7,000 travel branches. It has both a commercial and a regulatory role:

- **Commercial** ABTA maintains a high public profile with regular appearances in the press, on radio and on television. Over 80 per cent of the UK public now recognize the ABTA name and are aware of the financial protection offered by its members. A public information service handles thousands of enquiries each week and a consumer affairs service operates in liaison with member organizations. ABTA's Travel Training Company is a wholly owned subsidiary aimed at raising standards throughout the industry through education and training.
- **Regulatory** ABTA maintains a code of conduct governing the relationships: (a) between tour operators and travel agents, and (b) between ABTA members' and their clients. Apart from inspecting all members' accounts, it also has rules on financial protection of members' clients specifying individual bonding requirements for travel agents and tour operators. ABTA has two wholly owned insurance subsidiaries through which cover may be obtained to support the scheme of financial protection.

ABTECH is supported by Autofile, British Telecom, Galileo UK, Owners Abroad, Sabre's Travel Information Network, Voyager Systems and NatWest Streamline. The products and services offered by most of these companies are presented in the remaining chapters of this book. ABTECH is operated by a travel industry consultancy called The Link Initiative. ABTECH's work programme is

determined by a project board comprising representatives of the supporting companies and chaired by Dr Graham Barnes who reports on progress to ABTA. The primary aims and objectives are:

- To improve continually the unbiased technology advice available to ABTA member tour operators, agents and other organizations agreed by the project board.
- To be accessible to relevant suppliers as a source of feedback on planned products, thereby exerting a positive influence on developments.
- To understand better the ways in which technology is used and can be used in future, in the travel industry.
- To act as a focus for relevant co-operative projects that move the industry forward.

One of the ways in which ABTECH carries on a dialogue with agents is via a help line. The ABTA Helpline enables ABTA members and others to source unbiased information and advice on travel industry technology free of charge. The Helpline is a nation-wide telephone service that allows callers to telephone ABTECH at a local call rate no matter where they are located in the UK. A large and growing database of travel system suppliers is maintained by ABTECH and details can be provided to callers on request. The ABTECH Helpline is on (0345) 581339.

IATA

IATA is really best described as the trade association of the world's airlines. It has its headquarters in Montreal, Canada, and is active in many areas of the airline industry from ticketing through to air traffic control. The principal areas in which IATA is active are:

- **Ticket standardization** This is concerned with standardizing the usage and format of airline tickets around the world. The widespread use of a common and standard ticket helps promote bank settlement plan (BSP) type schemes and increases the operating efficiencies of airlines in general. This benefits the passengers directly and indirectly in availability and acceptance of standard tickets world-wide.
- **Tariff rules** Not to be confused with pricing or fare setting, this activity is aimed at defining the rules that govern how each tariff, i.e. air fare, is to be applied and sold to travellers. Rather like the conditions of use really.
- **Agency programmes** These are IATA's accreditation and appointment activities in the travel agency and cargo sectors. It is important to note here that IATA does not itself offer customers protection. So that when, for example, a travel agent is IATA licensed and displays the familiar IATA sticker on the door or window of the agency, it does not imply any form of consumer protection. It simply designates the travel agent as meeting certain standards set by the IATA airlines. Agents meeting these standards can, subject to specific airline authorization, sell tickets on behalf of airlines.
- **Bank settlement plan (BSP)** This is concerned with standardized airline settlement procedures for ticket sales from travel agents in countries or areas that have decided to implement a BSP (see Chapter 7 for a full description of BSP).
- **Inter-line billing** This is how the airlines do business with each other. When a passenger buys a ticket with several sectors on it, it is quite possible that each will be flown by a different airline. The inter-line billing process supports the distribution of the ticket sale revenue collected by the carrier that issued the ticket, to the other airlines involved in the traveller's itinerary.
- **Taxation** It is perhaps not surprising that this is a core activity of IATA because running a global airline business is no trivial matter from a tax viewpoint. There are therefore many issues dealt with in this area of IATA activity. On behalf of a large number of airlines, IATA works closely with the various government agencies around the world.
- **Technical** There is a special department that deals with air traffic control (ATC) matters on behalf of airlines. Again, in this area, there is a great deal of liaison with government departments and regulatory bodies.
- **Marketing** A special department within IATA exists to co-ordinate market research activities, such as in-flight surveys, that are designed to obtain marketing information from travellers. The ultimate objective is to obtain information

needed by airlines that will help them to improve service levels and deliver more accurately what the customer actually wants.

- **Data processing and systems** This is an IATA run group that is available to member airlines for special IT related projects on a chargeable service bureau basis.

IATA is run by a director general with a number of senior directors reporting to him. There is, however, also an executive committee, the membership of which is drawn from very senior members of airline management. For example, Sir Colin Marshal and Bob Crandal are representatives. The policies of the association are agreed at the annual general meeting (AGM). All members have a vote and can therefore influence the various conferences where policy detail is developed. Unanimity voting applies at conferences. The following are examples of some conference activities:

- **Passenger agency services** This conference focuses on distribution matters such as travel agent accreditation and the effective implementation of BSP around the world.
- **Passenger services** Activities concerned with reservations, ticketing and interlining.

Other sub-committees and *ad hoc* working groups support the objectives of the conferences. Without IATA accreditation, a travel agent is not allowed to issue BSP standard airline tickets. In order to gain IATA accreditation an agent has to demonstrate that it meets certain criteria aimed at establishing its ability to carry out the functions of an IATA recognized agent. One such requirement is to satisfy IATA that it is capable of looking after stocks of blank airline tickets that are, after all, an important form of value. If blank ticket stock falls into the wrong hands as a result of theft or fraud, for example, it can be instrumental in defrauding the airlines of substantial funds. The travel agent must therefore have a secure office and a safe in which to store blank ticket stock. IATA also needs to be assured that the travel agent is fully capable of writing tickets and accounting for them. One way to satisfy IATA on this score, is for the travel agent to send staff on the appropriate fares and ticketing courses. This is an excellent way for staff to attain specific levels of competence.

Figure 1.2 The TTI logo

TTI

The TTI (Fig. 1.2) is a not-for-profit European industry user group that is one of the most important standards bodies in the travel industry. TTI promotes the development and use of open systems within travel, tourism and leisure. It has been successful in many areas, particularly the development of UNICORN and RESCON (more of which later), and also in the area of ferry standardization using EDI. RESCON, the UNICORN standard (as used in the AT&T Istel 'Ferry' service) and the development of the ATB2 standard for non-scheduled airline operations are probably the best and most prolific examples of successful standardization in the UK travel industry. It is therefore worth examining TTI in a little more detail.

The members and structure of TTI

The Travel Technology Initiative was created in 1987 by seven founder member companies, several of whom had previously originated a tour operators working committee known as the Holiday Systems Group e.g. Redwing, Owners Abroad, Fastrak. By 1996 this had grown to almost 100 members, 15 per cent of which were European based companies. The 12 shareholders of TTI are: Airtours plc, Brittany Ferries, Cosmos plc, Eurostar (UK) Ltd, First Choice plc, Hoverspeed, Imminus, Irish Ferries, P&O European Ferries, Stena Line, System Aid Technology Ltd and Travellog Systems. Each of the founding members contributed investment funds for the development of the TTI.

In 1995 TTI actively grew its membership. It formalized a structure and set about pursuing activities that would deliver real value to members. Membership was opened up to other categories, besides shareholder, for example: executive, corporate, associate and trade body. Each membership category pays a fee commensurate with the benefits

enjoyed. The following is a summary of the various membership categories:

- **Shareholders** These companies have a stake in TTI and consequently play a full part in the development of the group's plans. Company representatives attend all regular board and executive committee meetings and are entitled to vote.
- **Executive** This category of membership allows representatives to attend executive committee meetings, participate in working parties and general meetings. Executive members receive technical specifications free of charge.
- **Corporate** Corporate members may participate in general meetings and receive important specifications at a substantial discount. They also receive release notes and technical briefs.
- **Associate** There are over 55 technology and travel companies who have joined TTI on an associate membership basis. The advantage for these companies is that they are kept fully up-to-date with all TTI's activities and plans for a very modest investment.
- **Trade association** Representatives of other travel trade associations may become members of TTI for a low fee and yet still enjoy many of the benefits, such as one call per month to the help line and access to many of the important publications.

In order to ensure that these levels of membership mesh effectively, TTI is run within a well organized structure. The board meets quarterly and consists of shareholder members; it provides overall strategic direction and control, agrees the organization's budget and sets fee levels. A management committee with members from the TTI executive, meets monthly and manages the budget. The technical standards working party meets prior to the management committee and addresses all technical development projects. Within this overarching structure, several working committees undertake research and development activities both within the membership and throughout the industry in general. They then make recommendations to the board.

One of the key success factors of TTI is that participation on working committees is open to all executive members. Contributions to working committee efforts are given without cost or charge-out from the members involved. It is in this way that TTI is able to leverage the strengths of its members and co-ordinate the activities of working committees as quickly and effectively as possible.

The formation of TTI

The founder members of TTI felt strongly that as travel industry technology progresses and advances in the coming years, it is necessary to have some central forum where users and suppliers could meet and discuss developments on neutral ground. These were early days in the formation of the systems we take for granted today. But much of what is now available would not have been possible in such a short time without the establishment of standards and guidelines at an early stage.

While all the founder members were in competition with each other in their own marketplaces, as holiday companies or system suppliers they knew only too well that co-operation was needed if technological developments in all areas of the travel industry were not to suffer. The industry has so often seen the damage that competing standards have done to systems developments. On the domestic front, how much more advanced would video be today if so much time, money and energy had not gone into rival recording methods, e.g. Betamax and video home systems (VHSs)? In such circumstances one system will eventually dominate the market, but the price is an enormous waste of resources.

All the founder TTI members shared a vision of the benefits that technology could bring to every sector of the travel industry. Equally, many feared the nightmare of disparate development, competing standards and the eventual writing-off of dead-end developments. TTI was formed to ensure that everyone involved in the industry could put all their efforts into the achievement of that vision, safe in the knowledge that a totally impartial body was there to monitor progress and keep all its members fully informed of individual developments.

The objectives of TTI

In order to carry out its work effectively the TTI set out its key objectives at an early stage in its development. All the work done by TTI since this time has been based on and has adhered to these objectives. They are:

- To use technology to maximize business opportunities and improve margins for all.
- To develop standards for technology in travel.
- To ensure systems are developed to a common standard and thus to reduce development costs.
- To allow all users to invest in technology, secure in the knowledge that it will be supported.
- To achieve consensus through discussion and co-operation.

TTI believes these objectives to be as valid today as when they were first set out and experience has proved that they have been an important guideline to all TTI's efforts in bringing rival players together in a spirit of mutual co-operation for the overall furtherance of technological developments within the travel industry. Having said this, it is natural that questions get asked from time-to-time about how TTI members see the role of their organization within the industry. It might therefore be worth mentioning what TTI is not. The objectives of TTI are *not* to:

- Seek self-interest for members or to dominate the industry.
- Impose standards – neither hardware nor software.
- Force compliance.
- Refuse to allow TTI's products to be distributed to non-members.

In this way TTI hopes to make it clear that it is there to help, to encourage development and to act as a forum for all suppliers and users of systems (Table 1.1) with the overall objective of achieving a more professional and profitable industry for all concerned.

The current activities of TTI

TTI is active in many areas within the travel industry. It organizes two general meetings each year for its members and specially invited guests. It holds executive meetings and board meetings that govern the overall direction of the group. TTI also produces two regular publications: (i) *News and Views* – a 12–16 page publication issued twice each year (currently January and August), which airs topical views on industry matters; and (ii) *Working Together* – a monthly news-sheet circulated to all members. Also, the TTI Web site, which is hosted by BT, may be found at **http://www.tti.org**

But it is the activities of the working parties that spearhead the progress that TTI delivers to its members and the industry. These have so far concentrated on the following main areas:

1. The identification of secure document printing as a requirement for the industry.
2. The development of a standard ticket – initially this will be a manual ticket but the focus of attention is now shifting towards the ATB2 area and other forms of electronic ticketing.
3. The continuing development of UNICORN electronic data interchange (EDI) messages.
4. The playing of a leading role in the United Nations' EDI for reservations and confirmation Expert Group No. 8 (UN EDIFACT EEG8) working committees (see UNICORN below for more details).
5. The establishment of EDI as the base for future technological developments.

To ensure that all this work proceeds apace, TTI now has two main working committees covering: (a) general management, and (b) standards. The management committee deals with the general running of the TTI 'business' as well as contracts, licences, public relations and other commercial activities. The standards committee is involved in the development of future standards. This committee is currently looking at invoices, confirmations, EDI messages for IT reservations and interfaces with CRSs and GDSs. Special interest groups are also supported by working committee members as appropriate, e.g. liaison with the Retail Tour Operators Group (RETOG) – see below.

In addition to these committees, all of whom are of course manned by people with full-time jobs of their own, TTI has also appointed a well respected independent consultant, Equinus, as a source of technical expertise and to co-ordinate and help drive forward all the developments including the provision of administrative support. While all the work of TTI is carried out by the working committees, the overall direction is set by a business plan that encompasses all TTI activities and runs for a 12 month period. The overall business objectives of TTI for the near future are:

Table 1.1 TTI membership benefits

Benefits	*Membership categories*				
	Shareholder	*Executive member*	*Corporate member*	*Associate*	*Trade association*
Attends board meetings	✓				
Attends executive committee	✓	✓			
Votes at executive committee	✓				
Eligible to chair TTI meetings	✓				
Receives minutes of executive meetings	✓	✓			
Participates in working parties	✓	✓			
Receives minutes of working parties	✓	✓			
Participates in general meetings	✓	✓	✓	✓	✓
Technical specifications Free					
A 50 % discount	✓	✓	✓		
A 20 % discount				✓	✓
Release notes and technical briefs	✓	✓	✓		
TTI publications Free					
A 50 % discount	✓	✓	✓		
A 20 % discount				✓	✓
Free access to TTI helpline	✓	✓	✓		
Telephone support (maximum calls per month)	Unlimited	Unlimited	4	1	1
Free copy of *News and Views*	✓	✓	✓	✓	✓
Free copy of monthly circular	✓	✓	✓	✓	✓
TTI seminars Free places, 2					
A 50 % discount	✓	✓	✓		
A 20 % discount				✓	✓
TTI special meetings – guaranteed place	✓	✓	✓	✓	✓
Preferential rates at TTI promoted events	✓	✓	✓	✓	✓
Link from TTI web page	✓	✓	✓	✓	✓

- **Ticket issue** TTI intends to continue developing the specification for ATB2 ticketing.
- **Confirmations and invoices** TTI will be looking at the definition of certain EDI messages and the design of a standard invoice layout. It will also give consideration as to whether documents should show a TTI logo or whether retailers could or should be able to issue such documents on their own customized stationery that may not adhere to the standard layout.
- **EDI messages for tour operating** In this highly complex area, TTI will be involved in liaison with the EEG8 group of the EDIFACT UN working committees, to assist with and drive the development of these messages. Consideration will be given to the need to develop TTI-specific messages if EEG8 is not progressing quickly enough for TTI members' needs.
- **EDI modules for PCs** TTI has defined the functionality required for a PC to handle all

anticipated TTI standards. This is known as RESCON (see below for details). This in turn means that the PC should be able to:
  - Hold ticket, invoice and confirmation data prior to printing.
  - Convert messages from screens into TTI–EDI format to send to hosts and reconvert responses for screen display.
  - Provide by-product data capture for back office systems.
  - TTI will also produce a list of approved PC plus software that meet all the above requirements. However, it must be stressed that TTI will not itself provide hardware or software.
- **CRS interface** Airline CRSs and GDSs are now key players in travel technology. TTI will pursue dialogues with all the CRSs and GDSs in order to encourage the development of standard interfaces between the present TTI hosts and CRS networks through EDI. If possible, this will include standard methods of ticket and documentation printing and the use of automated ticket and boarding passes (ATBs) and generic reservation screens.
- **Other EDI** The task in this area is to consider the development of standards for messages in other system areas including reservations in those fields not already covered, plus check-in messages.
- **Standards** TTI has already set up and will continue to maintain a central library of all hardware and software available to handle TTI functionality, identifying in each case whether that product has the TTI 'seal of quality'.
- **Millennium** TTI have launched a millennium initiative. The aim of this is to increase awareness of the date change issues involved and to provide a help pack with check list for companies. Some key issues for supplier systems are: will they release the room on the correct date over the millennium period, will they continue to issue tickets on the correct date, and will systems provide a compliance certificate similar to that demanded by BT?

Information on all these activities will be made available, not only to members, but also to non-members on request. These and other subjects that may arise are being examined by the working committees with founder and participating members attending meetings to develop the projects. In addition, associate members, while they do not attend executive meetings, are encouraged to help and make their views known either directly to the relevant committee or to the TTI retained consultant.

TTI encourages new members to join and to both: (a) spread the use of standards, and (b) assist in the development of new standards. In particular, more smaller retail members are currently sought. All TTI standards are placed in the public domain for all to use and review as they see fit. In order to join TTI an organization or individual need simply write to the membership secretary.

UNICORN

UNICORN is a set of standards for EDI messages used within the travel and tourism sectors of industry. It started out as a TTI initiative that aimed to use EDI technology to simplify and standardize the way in which bookings were handled across different supplier host systems. This was a particularly relevant issue for Germany's START system when it faced a costly development exercise resulting from the interconnection of its multi-access switch to several cross-channel ferry companies. Since that time, UNICORN has grown in scope and complexity to cover a wide range of inter-system communications, including the secure printing of ATB2 tickets (see Chapter 3).

It is now the leading global standard for system-to-system communication via EDI *message sets* within the travel industry. In this context a *message set* is simply a standard format that governs a two-way conversation between two computers. There are now over 130 different such message pairs that are standardized under the UNICORN banner. Messages that, for example, pass between a travel agent and a tour operator, such as: (i) show me the latest availability for a certain tour, (ii) book me the tour currently displayed, (iii) sell me a travel insurance policy, and (iv) print me a ticket. There are two other standards that are particularly relevant to the development of UNICORN, one

is the UN's EDIFACT and the other is IATA's Passenger and Airport Data Interchange Standards (PADIS). Each is described more fully as follows:

- **UN's EDIFACT** UNICORN is similar to the UN's standard known as EDIFACT. This is the world-wide standard agreed by the UN known more fully as: *EDI for administration, commerce and transportation*. The main differences between these two seemingly overlapping standards is that EDIFACT focuses on batch messages, i.e. messages with long intervals of time between the originating message and the response; whereas UNICORN is used primarily in cases where an interactive dialogue between two computer systems is involved. Where computers communicate interactively, the interchange of message pairs is said to be in *fast batch* mode or, put another way, using *interactive dialogue*.

  Having said all that, EDIFACT also incorporates an interactive dialogue standard known as I-EDI or interactive EDI. However, this is a generic set of standards that applies to virtually all industry and commerce sectors. As such, it is not specific to the travel industry, whereas UNICORN is designed solely for use within travel and tourism.
- **IATA's PADIS** This is an IATA board that has developed a set of standards, mainly for computer systems that need to communicate information concerning air freight, weight and balance calculations and some passenger information, with other computers. IATA has worked with the UN to submit some PADIS messages for approval as UN/EDIFACT. In fact, just lately, there have been many PADIS messages introduced into EDIFACT.

The European Commission is keen to see the convergence of world-wide standards. It has therefore provided part-funding for the migration of UNICORN standards to make them fully compliant with I-EDI, within the UN/EDIFACT sphere. Other standards bodies have also been involved with TTI including the European Board for EDI Standardization (EBES), which runs an important sub-group, EEG8, that focuses on travel, tourism and leisure (formerly known as the MD8 group).

TTI has consequently been pretty busy over the past few years, just with the development and promotion of UNICORN. This activity has, however, paid dividends in terms of standardization and has governed the core activities of TTI since its inception.

UNICORN has therefore been developed using a phased approach, over several years. It is for this reason that there are different versions of UNICORN, each of which has been released at different times over the past few years. It is nevertheless the case that each version is totally *backwards compatible* with earlier versions. This means that if, for example, you have implemented Version 4.1 then you will not have to change your systems if you then migrate to Version 4.2 at some point in time. The various releases of UNICORN are summarized as follows:

- **Version 4.1** This was (in the first quarter of 1997) the current version. RESCON is an integral part of Version 4.1 (see below).
- **Version 4.2** This version was released in February 1997 and includes support for rail message pairs.
- **Version 5.0** This version will be totally compliant with UN/EDIFACT for I-EDI and was scheduled for release during the first half of 1997.

When a company purchases UNICORN (which in the first quarter of 1997 cost £500), they receive a developers pack. This contains all required documentation specifying the standards and may in the future contain a relational data base of message formats and software libraries.

TTI's RESCON

RESCON, which stands for *res*ervation *con*firmation, is an outstanding example of what can be achieved by standardization. The problem that TTI set out to tackle was one that travel agents were all too familiar with. This was the tiresome task of keying a customer's booking data twice; once into the videotex reservation system and then again, into the agency's own back office system. The root cause of this duplicate keying effort was the different formats used by tour operator systems

to record a customer's booking. Let's take a look at this in more detail.

Most tour operators have developed front-end communication interfaces for their booking systems based on videotex technology (sometimes called viewdata – see Chapter 6 for more details). However, travel agents are increasingly using PCs that can emulate a videotex terminal and also provide the added benefits of general office automation and GDS access. The trouble is, that once a travel agency user makes a booking in a tour operator's videotex system, the very same information must be manually re-keyed into their own back office or agency management system. It is this system that then prints the itinerary for the customer as well as other relevant information on the booking. Booking information includes the following fields of data:

- Lead passenger name.
- Address.
- Flight times.
- Itinerary dates and times.
- Other passenger names.
- Booking reference.
- Accommodation details.
- Financial information.

Now, many agency management systems provide an automated interface to some of these tour operator systems. This is done by special applications software that maps each field from the tour operator's videotex screen display into a standard booking record, as defined by the agency management system supplier. However, it's not that simple because each tour operator's system is different and this means that the booking information as displayed on the final videotex confirmation screen is different; in other words it is non-standard.

Agency management system suppliers tried to get around this problem by developing several maps, one for each major tour operator system. That was all very well until the tour operator changed their booking screen, which does happen from time to time. However, such changes cause havoc to system suppliers that provide booking confirmation maps. Each map had to be changed to reflect the new format. Invariably, changes to these maps meant that the travel agent had to install a new version of software. Some suppliers tried to make the mapping process more responsive by providing the agency with the means to modify the maps themselves. But this is a complex technical process and one that is fraught with difficulties to trap the unwary. Even the Global Trade Initiative (GTI) failed to address the problem (see Chapter 6). Something had to be done.

The answer was provided by TTI. They worked closely with some major tour operators, travel agency users and system suppliers over a period of nine months. Some of the EDI work was salvaged from the abortive GTI initiative. A TTI working group was formed and met on many occasions. Members eventually jointly agreed on a common standard for a booking confirmation. A common booking record format based around the EDI standard was then developed. This enables all booking fields to be identified and labelled thus enabling different computer systems to recognize and process the content of the message. Even TTI non-members, Thomson, Galileo UK and Lunn Poly, participated in the development of the standards.

The resultant structured messages are not videotex specific and are in fact generic to any type of computer system: and to support this standard booking record format, some special new software known as a *message handler* was written. To use RESCON the *message handler* software must be used by both the tour operator's and the travel agency's PC systems.

Once installed, videotex bookings are processed as normal. The only difference is that travel agents can choose to have the booking details downloaded to their own system when confirming a booking. This takes only a couple of seconds, leaving the travel agent's system to do what it wants with the information – typically storing the booking data within its customer record. From here it can be retrieved at any time and fed through to the payment system of the tour operator. It can also be used to print ATOL receipts (now a legal requirement for package holidays) and seat-only bookings; all of this can be done without any re-keying by the travel agency. The benefits may be summarized as follows:

- Elimination of duplicate keying by travel agents; once into the videotex booking system and again into their agency management system.

- Improved accuracy because data is recorded by the tour operator's system and downloaded electronically without human intervention, into the travel agent's system.
- Enhanced customer service due to the automatic printing of accurate reports such as the ATOL customer receipt.
- Reduction in the tour operator's efforts associated with answering accounting queries and reconciling the travel agent's payments.
- Elimination of system maintenance tasks associated with maintaining tour operator booking screen maps for conversion by agency management systems.
- Improved security because RESCON uses error detection and correction transmission techniques that can identify and correct errors due to such things as *line noise*.
- Establishment of the basic building blocks for future secure printing of items such as travel tickets, invoices and receipts.

Live usage of RESCON commenced in April 1995. It is now used by the tour operator Cosmos with 140 Co-op Travelcare branches and by Eurostar UK and Galileo. The technical infrastructure of RESCON was developed in nine months for a shared investment of £20,000. This was undertaken by TTI and 12 leading travel companies: Airtours, A. T. Mays, Best, Co-op Travelcare, Cosmos, First Choice, Going Places, Sunworld, Lunn-Poly, Stena, Thomas Cook and Thomson. RESCON involves no licence fees or maintenance charges and has been developed as an *open system* for use throughout the travel industry.

The Retail Tour Operators Group (RETOG) has now been re-formed to work with TTI on the future development and enhancement of RESCON. Many tour operators have already built RESCON functionality into their systems. Others recognize that RESCON could be the platform for future growth and development that they have been seeking for many years. In particular, tour operators are actively considering the following areas:

- **Update messages** Even when a passenger books a holiday, there are often times when the tour operator needs to communicate some changes to the package. RESCON could be enhanced so that the tour operator's system could transmit a message to the travel agent's system, which could then amend the booking details held locally. Eventually, the travel agent could then notify the customer.
- **Quote message** There are many cases where a customer will peruse the tour operator's systems with the help of the travel agent. In some cases a quotation is required before a final confirmation is made by the customer. RESCON could be enhanced to transmit a quote automatically to the travel agent's system for local printing and transmittal to the customer.
- **Printing messages** There are many items that the tour operator would like to see automatically produced by the travel agent's own system. Some examples include confirmation advices, tickets and baggage tags. RESCON could be enhanced to print these securely on behalf of the tour operator.

TTI has achieved a high degree of success in the development of IT standards within the worldwide travel industry. Besides the widespread use of UNICORN and RESCON, there are many other examples of TTI's success. Take, for example, the Greek Government, which has recently stipulated that UNICORN should be used nationally in order to control the overbooking of ferries; and also the French tourism industry where calls for UNICORN to be supported by supplier systems are widespread.

HEDNA

HEDNA is a not-for-profit organization that was formed in 1991 by hoteliers to promote and accelerate the use of GDSs and other electronic means for the booking of hotel reservations. It is now recognized as the major conduit for training and the dissemination of information relating to all electronic distribution issues for the hotel industry. The mission of HEDNA is to increase hotel industry revenues and profitability from electronic distribution channels by:

- Optimizing the use of current technology.
- Influencing the development of current and emerging electronic distribution channels.
- Education.
- Providing an opportunity for open exchange among members.

Programmes

The following is a brief overview of the major activities of HEDNA that are undertaken on a regular basis. These programs may change from time-to-time so as to recognize the needs of members:

- **HEDNA meetings and conferences** Provides networking opportunities to gain insight into how peers, suppliers and customers view the industry, how business is conducted and how it can be improved.
- **HEDNA GDS educational materials** The curriculum of HEDNA University is available to cater to all audiences in three formats: self-guided workbooks, self-paced computer training and presentation style. All formats have been combined into a kit and are available on diskettes for company personalization.
- **HEDNA GDS pocket reference guide** Formats at your fingertips. This handy guide lists general hotel availability, description and sell formats for all of the GDSs. It is ideal for sales managers who deal directly with the agency community.
- **HEDNANet** HEDNA's Internet Web site that facilitates member and non-member access to all HEDNA resources including educational materials, meeting schedules, membership information, new minutes of meetings, etc. (also see **http://www.hedna.org** – a Web site for use by HEDNA members).
- **Technology showcase** Provides hands on product demonstrations of current and emerging technologies for hotel distribution.

Structure

HEDNA's officers consist of a president, vice president, secretary and treasurer. These officers, along with five elected members and three invited members, compose the board of directors. Elected board members are hotel company executives and each serve two-year terms. Invited members serve for one year. The executive director, who is responsible for the HEDNA staff, is an ex-officio member of the board.

Associations such as HEDNA need to find an efficient way of dealing with regular day-to-day administration. One solution is to out-source these functions to a specialist service company. Hakanson & Company, an association management company, has consequently been engaged to provide HEDNA with services that include: office-of-record, financial management, membership development and records management, publication and materials dissemination and other association management services as needed.

HEDNA Europe, Middle East and Africa (HEDNA EMEA) was formed in 1994 and is responsible for the organization's activities within this region, using the main HEDNA group as an effective transatlantic communications channel to North America. This allows developments in this area to be disseminated and shared throughout all HEDNA Chapters. This sub-group is known as the HEDNA EMEA Chapter and is officially recognized by the HEDNA main board. It does not, however, maintain a separate membership from HEDNA and adheres to the core mission statement but with special emphasis on education, conferences and seminars.

Support and enthusiasm for HEDNA has grown substantially in the late 1990s and evidence of this is the formation of European regional sub-groups. The first such HEDNA sub-committee was formed in Italy during 1996. In order to support the growth of HEDNA sub-committees in this way, a standard operating procedure has been produced that defines how to set-up, manage and run a regional HEDNA Chapter.

Committees

The strength of the HEDNA organization is the opportunity to participate on various industry committees, which work to further HEDNA's mission. Members are welcomed and invited to participate in any of the HEDNA committees, which include:

- **GDS** There is a separate committee for each GDS. Each committee serves as a focus group where representatives of the GDSs meet with HEDNA members to standardize, simplify and accelerate the use of their systems in the booking of hotel reservations.
- **Standards** The focus of this committee is on hotel industry standardization as it applies to GDSs and other electronic distribution channels.

The principal areas where HEDNA supports the development of standards includes, but is not limited to, EDI message formats, keywords and the identification of data fields that need to be shown on the computer screens of systems used by hotel properties and chains.

- **Education** This committee addresses the issues that relate to the planning and execution of HEDNA University sessions. Also included are any other training and educational needs identified by HEDNA, such as the preparation and execution of training material.
- **Leisure** A separate committee has been formed to consider the issues that relate to the distribution of leisure-oriented products and package tours through GDSs and other electronic channels.
- **Request for proposal (RFP)** This committee addresses standards that govern the transfer of electronic data for the RFP process that is used throughout the accommodation industry.
- **Meetings** Separate committees plan and execute HEDNA meetings. The tasks undertaken include, but are not limited to: site selection, contract negotiation and on-site co-ordination.
- **Technology** This committee is responsible for HEDNA's Internet site, called HEDNANet. One of the tasks related to this is the effective co-ordination with each of the other HEDNA committees to ensure that the information displayed on the HEDNA Web site is: (a) current, and (b) available to all HEDNA members. The committee also monitors emerging technologies and keeps HEDNA members abreast of the latest developments in hotel distribution.
- **Marketing** The marketing committee helps develop and implement the overall HEDNA marketing plan. These activities include: membership recruitment, communications, public relations and surveys.

Membership

The membership of HEDNA has grown significantly since the organization's foundation. Membership is open to any entity or individual whose actions, goals and purposes are consistent with the mission of the organization. There are three types of members:

- **Principal member** A principal member may be either: (a) a lodging or hospitality company, or (b) any company that manages the sale of rooms through electronic distribution systems for other lodging and/or hospitality companies. This category of membership has full voting rights and is reserved primarily for hotels. A fee of US$500 per year is payable by all principal members, of which there are currently 139.
- **Allied member** This category of HEDNA member comprises companies or individuals who provide, or desire to provide, products and services to principal members. This is a non-voting associate membership costing US$1,000 per annum that is designed mainly for GDSs, CRSs and independent consultants. There are currently 31 allied members.
- **Associate member** These are companies or individuals who are not eligible for principal or allied membership, e.g. travel agencies, tour operators, educational institutions. This is a non-voting associate membership costing US$100 per year. There are currently 36 associate members.

HEDNA brings together participants from every aspect of the electronic hotel booking process. In the autumn of 1996 HEDNA's membership totalled over 200, including hotel companies, hotel representation companies, major travel organizations, consultants, travel technology service vendors (including all major GDSs), all hotel switching companies and international travel media. Evidence of HEDNA's success is the consistent support from its member companies. This support is repeatedly demonstrated through their willingness to provide staff time for HEDNA related activities.

The benefits of HEDNA membership are many and varied. There is, for example, the opportunity to attend world-wide conferences, technology briefings and meetings of peers, as well as access to the HEDNA educational kit and annual market survey reports. Plus the ability to experience direct involvement with GDSs and influence their future direction along with the chance to benefit from the tools and presentations that help optimize the use of current technology. Membership also provides access to new technologies, such as the Internet's HEDNANet site.

Code of conduct

An organization such as HEDNA must be careful to avoid any accusation of being a cartel or acting in a monopolistic way. It is primarily for these reasons that a definitive code of conduct is so important to HEDNA. So, in accordance with regulations stipulated by the USA antitrust laws and Europe's Treaty of Rome, the following code of conduct is strictly enforced at all HEDNA gatherings:

1. HEDNA does not permit the discussion or exchange of information relating to:
   - Room rates.
   - Surcharges.
   - Conditions.
   - Terms or prices.
   - Allocating or sharing of customers.
   - Refusing to deal with a particular supplier or class of suppliers.

   Neither serious or flippant remarks are therefore permitted on any of these topics at HEDNA meetings.
2. HEDNA does not issue recommendations on any of the above subjects or distribute to any of its members any publication concerning such matters. Information exchange or discussions that directly or indirectly attempt to fix purchase or selling prices is not permitted to take place.
3. Standards or certification requirements for membership must give equal conditions to all similar parties.
4. All HEDNA-related meetings shall be conducted in accordance with previously prepared and distributed agendas.
5. All HEDNA-related meeting agendas will contain standard topics including:
   - Educating the HEDNA membership.
   - Improving GDS functionality and making technical progress.
   - Improving distribution of the hotel product.
   - Standards of display and codes used in the GDSs and other electronic hotel booking media.
6. The objective is free exchange of ideas consistent with the HEDNA mission statement, to the benefit of the travel industry.

Achievements

HEDNA has made some real progress in achieving its aims. In addition to establishing a vital forum for the exchange of ideas relating to the electronic hotel booking process, HEDNA members are proud of many important accomplishments. These include:

- **Improved GDS bookings** Identifying and addressing impediments to electronic booking through extensive discussions between hotel, travel agency and GDS representatives.
- **The Hotelier's GDS educational manual** Developed in co-operation with Cornell University School of Hotel Administration, this publication is a comprehensive manual for the electronic reservation environment. In addition to serving as the primary text for HEDNA University, it is used at Cornell as a teaching resource in its hotel management programmes.
- **HEDNA University** This is a one-day educational event that is run by HEDNA. In slightly over one year, there have been more than 400 graduates of the HEDNA University programme. 'University days' have been held in Europe, Canada and the USA and are taught by volunteer members of the organization.
- **HEDNA GDS educational kit** A three-part self-guided training programme. This is available in either a computer-based version or as self-guided work books with a teacher's guide for group applications. The kit provides:
  - An introduction to GDSs.
  - A description of hotel staff's roles in the electronic booking process.
  - A comprehensive summary of GDS marketing and sales opportunities.
- **HEDNA electronic reservation statistical survey** This is a survey that is conducted annually to identify trends in electronic hotel bookings. Results are available to HEDNA members.

GBTA

The Guild of Business Travel Agents (GBTA) was formed in 1967 by six London-based travel agents who felt their needs were not being fully represented by their national association, which was

more interested in the mass market and leisure business. Today, the Guild has 43 members, which include high street names like the country's giant multiples: American Express, Thomas Cook, Hogg Robinson, Carlson Wagonlit and the UK's leading independent business travel specialists.

Between them they generated an annual turnover in 1995 of £6.0 billion, i.e. more than £16 million each day, employed 15,000 people in over 1,500 outlets; and were collectively responsible for handling over 75 per cent of all business house air traffic generated by agents in the UK.

The Guild was officially incorporated in 1967 and became a limited company in 1987. It effectively represents the industry's good housekeeping seal of approval. Membership is strictly by invitation only, with each new member undergoing a rigorous vetting procedure before being allowed to join the ranks. All hold IATA licences and are members of ABTA.

Central to the Guild's philosophy is customer care. It constantly and vigorously strives to raise standards and the quality of travel for its clients in a myriad of ways. Prime among these is an ongoing dialogue with influential organizations like the European Commission, BAA plc, the CAA, airlines and hotel groups, in addition to governmental lobbying at the highest level. The Guild has its parliamentary consultant who advises and helps address key issues like new airport terminals and runways, improved road and rail links to prime hubs and a wide array of other matters of concern to the business traveller.

Apart from keeping up the pressure of lobbying in key areas, the Guild has embarked on a campaign to create even greater professionalism and quality in the industry. It initiated the first ever qualifications specifically geared to the business travel industry. The six month City and Guilds course leading to a Certificate of Business Travel (CBT) was introduced in 1991 and the first candidates to gain a CBT, received their awards in the early part of 1992. There is also a supervisory and a management level certificate.

The Guild believes that as the market continues to become more competitive, particularly with the advent of the single European Market, the necessity for high standards and superlative quality will be paramount. Technology is a vital ingredient in the Guild's campaign of excellence and is essential to the development of international travel and the infrastructure required to support the business traveller. The Guild employs a top consultant to ensure that members are at the forefront of technological progress and that new GDS and airline electronic check-in systems meet members' and their clients' needs well into the next century.

The Guild is a pioneer in professionalism and its client companies are assured of the highest standards of service in every sphere of commercial travel. At a time when international business has never been more fiercely competitive, reliance on professionally qualified and equipped agencies like those within the GBTA is quintessential.

GEBTA

The GBTA's interest is, however, not confined just to the UK alone. The GBTA helped to guide the formation of the Guild of European Business Travel Agents (GEBTA), which has an increasingly powerful role to play in Europe as a whole. GEBTA now has ten national guilds representing Austria, Belgium, Denmark, France, Ireland, Italy, The Netherlands, Portugal, Spain and the UK. GEBTA speaks with a unified voice on issues like value-added-tax (VAT) on European air fares, air traffic control, airline competition, etc. It has full-time representation in Brussels for liaison with the EC.

NAITA

In travel, just like any other retail business, it is the large businesses that can obtain the most favourable deals with their suppliers. The reason for this is the bulk purchasing power that the large buyer brings to the negotiating table. This is one reason why the large travel multiples have been so successful in winning new business based on very favourable pricing of their products and services. A large multiple can, for example, go to a hotel chain with the knowledge that it represents a substantial portion of the travellers who stay at the hotels in that chain. They can therefore negotiate a reduced room rate for their customers, based on a certain level of booking volume. Once

this special rate has been agreed it is up to the travel agency multiple to ensure that its branches actually deliver the number of bookings necessary to obtain the favourable rates as negotiated. This is what is termed buying power.

Well, that's fine for the large multiple agencies who used their buying power to enjoy a substantial competitive advantage over their smaller independent travel agency competitors for many years. However, the smaller independent agents soon realized what was going on and considered different ways in which they could organize themselves into a group that could represent a major buying force. This was one of the founding principles of the National Association of Independent Travel Agents (NAITA).

NAITA was formed in 1978 to represent independent travel agents carrying on business from branches or offices located in the UK, including Northern Ireland, the Channel Islands and the Isle of Man. It currently consists of member companies with a total branch network of over 700 offices employing 6,000 staff and is the largest retail travel agency group in the country representing almost 10 per cent of the UK travel agency population. Its membership has a combined turnover of some £1.8 billion of which £938 million is derived from leisure travel and £862 million from business travel.

Membership of NAITA is open to professional travel agents who meet the following criteria: (a) they must be members of ABTA; (b) they must have a minimum turnover of £500,000 if IATA licensed or £750,000 if non-IATA; and (c) they must have less than 25 branches at the time of joining NAITA. NAITA members currently cover the full range of travel agent activity with a substantial number of member companies choosing to specialize in either the leisure travel or business travel sectors.

NAITA is governed by a board consisting of one executive director and five non-executive directors. The executive director is a full-time salaried employee of the Association, while the non-executive directors are elected by the existing membership from within the membership. The board is chaired by a president who once again is elected by the existing membership from within the membership. The objectives of NAITA are to:

1. Promote and develop the trade, commerce and general interests of members of the Association.
2. Promote relations between members and others in the travel business and to provide the means for negotiations, discussions and liaison with other bodies concerned with the development of or in any way connected with the travel business throughout the world.
3. Inform and make public by way of television, radio, advertising or otherwise the activities of members and of the Association, and generally do all such things as may be necessary to raise and protect the prestige, reputation and status of members and of the Association.
4. Develop, investigate, improve and establish technological developments, marketing methods, discounting structures, 'money back' guarantee schemes, special insurance policies, bonding requirements and all or any other matters that may improve or affect the business of the members.
5. Promote and advance the cultural and educational aspects of travel, and the education and instruction of persons concerned or intending to be concerned with travel and travel agencies.

The strategy of NAITA is to develop the business of the small independent travel agency. In 1992 NAITA introduced the ADVANTAGE consumer brand to promote the qualities of its membership, together with the range, quality and competitiveness of its key operators (tour operators, airlines, car hire, cruise, ferry, hotels, etc.) to the travelling public. The continued development of the NAITA marketing strategy that enables quality operators and travel agents to promote jointly the highest levels of service, choice and competitiveness to the consumer is regarded as a primary objective.

In recognition of the importance of information technology in the modern travel industry, NAITA makes various IT facilities available to its member travel agents. These facilities include bulk purchase terms on PC hardware and both industry standard and tailor-made software. Bulk purchase deals such as these enable an organization to use the potential buying power of its combined members to negotiate favourable rates and prices on IT products with selected suppliers. After all, this is just what the multiples are able

to do on behalf of their own branch networks. NAITA also has arranged a teletext programme that enables individual independent travel agents to participate in this growing form of travel advertising at realistic cost levels. All these teletext pages contain an 0990 telephone number and callers are automatically and evenly distributed using the latest communications technology to participating members' offices.

Additionally, NAITA operates 'closed user groups (CUGs)' on both Galileo and Worldlink enabling its member travel agents to access restricted NAITA commercial data, relating to the leisure and business travel markets. I will explain CUGs in more detail later on, in Chapter 6. For the moment though, a brief description is as follows. A CUG is a portion of a large data base available to many users, which is closed off to all except a restricted set of registered users. So, in the case of Galileo, for example, there is a portion of information storage on the core system that only NAITA travel agents can access. Within this, there are certain pages that can only be created and maintained by NAITA head office staff. The pages of information created in this way are only available to travel agents who are registered NAITA members. Access is controlled by the Galileo system, which checks the user identification entered during the sign on process against a table of authorized NAITA travel agents. I'll be explaining all these terms later in the book.

Through such CUGs, NAITA members can communicate with one another, and with the NAITA head office. Using the information stored within the CUG, NAITA travel agents can provide their clients with 24 hour global emergency assistance facilities and access to preferred hotel, car hire and air seat rates. Such facilities enable NAITA independent travel agents to operate as a national chain of agencies in the UK, with global connections to their international associates for client servicing.

ENTER AND THE IFITT

The International Federation of Information Technology and Tourism (IFITT) organization has its origins in the highly successful series of ENTER conferences that were first initiated to help guide the development of tourism in Austria. In general, IFITT aims to promote international discussion on the subject of information technologies in the field of tourism. As such, one of its primary objectives is the organization of the annual ENTER conference that is held each year in an international setting. Information and communication systems now form a global network that have a profound influence on both the tourism and leisure industries. Reservation systems, distributed multi-media systems, mobile working places and electronics markets are all manifestations of this phenomenon. Advances in the use and deployment of tools, technologies and methodologies that have facilitated the efficient networking of information systems in the tourism industry and their economic and organizational impacts are all prime subjects for discussion within the Federation.

The initial development of the ENTER conference first started in 1993 during some preliminary research and development work being undertaken for the Tirol Werbung – the Tyrolean Tourist Board. The objective of this work was to produce a new tourist information system (TIS), aimed at promoting inbound tourism to Austria. As part of the project's design efforts, it was recognized that a forum was needed for discussing electronic media and their influence on tourism, especially in the following areas:

- The relationship between the internal and external management of tourism related information. Organizations need to rationalize how information is stored internally for use by its employees. However, this information, or at least parts of it, may also need to be communicated or made available to external parties. So the way in which sub-sets of internally stored information is distributed throughout the public domain is a key issue for players in today's travel and tourism industry.
- The characteristics of travel and tourism products as they flow through the industry's value chain from suppliers, through intermediaries to consumers. Each stage offers several opportunities for activities such as re-branding, price mark-up, inventory access and product marketing.
- The practical ways in which travel and tourism information may be stored electronically and distributed via telecommunications networks

throughout the value chains. With the rapid evolution of IT and scientific advances, completely new ways of managing and distributing information are now available.

- The inter-relationship of travel and tourism disciplines, which are now being increasingly integrated via IT. The separate study of tourism, management science and computer science are, for example, rapidly becoming inextricably linked.
- The lack of an international platform for exploring travel and tourism issues in the context of IT. At the time, in 1993, there was no international conference where these kind of issues could be aired, where people in the industry could learn from each other and where information on new developments could be shared for the benefit of the world-wide travel and tourism industry in general. IT experts knew of the potential of the Internet but were less aware of the practical applications of the technology.

A group of academics from the universities of Vienna, Switzerland and Germany worked with the Tyrolean Tourist Board to arrange a conference that would address the areas identified above. What was needed was a conference that would not necessarily focus on just topical products, but that would instead concentrate on discussing longer term trends in the industry and look ahead to what might happen in the future. The name ENTER was given to the fledgling conference – a name derived simply from the 'enter' key on all PC keyboards. Many organizations were contacted and invited to participate in the preliminary ENTER conference programme.

The structure of the ENTER conference was formed in the very early stages of its life. It was decided that each year the conference would have a single major topic or theme around which all presentations, papers and discussions would be organized. Speakers would be invited from leading travel and tourism companies and academic institutions. The conference would be segregated into several activities, each pursued on parallel tracks:

1. A scientific programme with a call for papers, a rigorous reviewing process and the publication of conference proceedings.
2. An applied programme that was to be a commercially oriented series of presentations focusing on IT in travel and tourism; a significant feature of which would be 'the ENTER debate'.
3. An exhibition of IT oriented products and services aimed at travel and tourism.
4. An annual Web award given to the best Internet Web site designed for a travel or tourism application in any part of the world.

The first three conferences were organized in close conjunction with the Tirol Werbung (the Tyrolean Tourist Board) and Congress Innsbruck. All these activities were also strongly supported by several other Tyrolean tourism institutions. The first ENTER conference was held in 1994 on the subject of the new electronic markets in travel and tourism. This theme was again repeated in 1995, and then in 1996 the topic of business process re-engineering and related standards was addressed. This conference was attended by over 400 people from 21 countries, and had more than 500 people visit the exhibition stands. The applied programme featured 15 presentations, eight workshops and two panels. The scientific programme offered 31 papers covering a wide range of topics.

The 1996 conference was highly successful and made it apparent to the participants that IT has led to a paradigm shift in the tourism industry. It identified a variety of trends such as the way in which individuals are beginning to build their own customized tours, the development of remote destinations, the emergence of global competition and the problems experienced by concentrating power in a few large tourism operators. These factors suggest that IT can be utilized to re-engineer the processes in order to ensure a fair allocation of the profit margins generated among tourism sectors. The conference also concluded that a culture of constant innovation had emerged with structural improvements in the travel and tourism industries arising from information management on a global scale. It was at this conference that the first Web award was given. This fostered an in-depth discussion of the Internet and World Wide Web in relation to the potential offered to travel and tourism product design, development, promotion, distribution and delivery, throughout the world.

For 1997, the organizers recognized the need for the conference to expand into the international arena and therefore decided to hold the conference outside Austria for the first time. In order to accomplish this and to move the organization of ENTER forward, a more formal and broadly based structure was needed. It was at this time, in the Spring of 1996, that IFITT was formally founded. Participation in IFITT was open to decision makers, researchers and scientists in the tourism industry and academia. In fact anyone agreeing with the following mission statement:

> The IFITT will, in the best professional tradition, seek to develop and maintain the integrity and competence of individuals and organizations engaged in information and communication technologies and tourism. The IFITT will promote the free interchange of information about these fields among specialists and the public. The mechanism which will allow this to happen will be the ENTER conference which will be an annual event open to members and non-members.

The IFITT was therefore created with the prime objective of organizing and running the annual ENTER conference. However, several other objectives related to the deployment of IT within the travel and tourism field were also to be included within the IFITT's remit. By this overt mechanism, the IFITT strives to support the concerted development and growth of IT in the field of global travel and tourism. It is a prime objective of the IFITT to become a lively forum for discussion and exchange of ideas. It aims to establish an international body of knowledge and to contribute to the process of theory building in this growing field. As an inter-disciplinary federation it is placed between information systems and tourism research activities, such that both fields may influence each other. The IFITT will promote the free interchange of information about these fields among specialists and the public. Finally, the IFITT can act as a well-informed consultant to governments and other industry decision makers.

As one of its first tasks, the IFITT decided to work with an international publisher to create a journal on IT in travel and tourism. This journal is still being developed and is therefore not yet publicly available, i.e. as at mid-1997, although when it is published IFITT members will be able to obtain copies at a discount. A market newsletter is also published regularly and this provides an overview of technological developments in the field. Linked to this is a news service run by IFITT which is based on electronic publishing and is available to members. All ENTER conference papers are published on the ENTER Web site at **www.tis.co.at/enter** and may be downloaded by anybody with access to the Internet. The IFITT also supports special interest groups, e.g. it provides guidance on the formation of academic courses with curricula that include IT in tourism, and arranges speakers for the ENTER conference programme.

An IFITT management committee decides the group's future strategies and addresses political issues. This committee also chooses the main forthcoming conference topics and the subjects that are addressed by both the scientific and applied programmes. The IFITT membership fees for 1997 were £50 for an individual member and £560 for an organization. Students are eligible to join the IFITT at a reduced fee. Table 1.2 shows the IFITT management structure as at 1997.

In its first year, 1997, the IFITT had over 80 members, many of whom attended the inaugural committee meeting that was held after the ENTER conference in Edinburgh. The Edinburgh conference spanned a three day period from 22 to 24 January, 1997. Subsequent IFITT general assembly meetings will be held immediately following each ENTER conference. It is at these annual sessions that management committee members are elected and the next conference site is selected. Attendees at these sessions are encouraged to contribute their ideas for the development of the next conference.

Edinburgh was the location for ENTER's first conference outside Austria and was a resounding success. Billed as the Fourth International Congress on Information and Communications Technology in Tourism, its theme was 'travel and tourism – the challenge of the digital economy'. The conference offered a stimulating programme of keynote presentations by speakers of international standing, a carefully structured programme of presentations on topics directly relevant to the tourism industry, workshops for detailed discussion of specific topics, a programme of scentific/research

Table 1.2 The IFITT management committee – 1997

Management committee	*IFITT role*	*Contact location*
Hannes Werthner	President	University of Vienna, Austria
Josef Margreiter	Vice President	Tyrolean Tourist Board, Austria
Roger Carter	Treasurer	Edinburgh & Lothians Tourist Board, Scotland
Walter Schertler	Secretary	University of Trier, Germany
Kari Aanonsen		Norwegian Computing Centre, Norway
Dimitrios Buhalis		University of Westminster, England
John Rafferty		Irish Tourist Board, Ireland
Eva Hafele	Managing Secretary	IFITT, Austria – e-mail: **ifitt@tis.co.at**

papers, a special lunch for the prestigious ENTER Tourism Web Awards and an exhibition featuring tourism applications using new technologies. It was attended by 400 fee-paying delegates and many more non-fee-paying participants. The Edinburgh conference supported 30 on-site exhibitors, each of which demonstrated and promoted their products and services to delegates throughout the three day conference. The official language of the conference was English and all proceedings were published by Springer-Verlag Wien New York immediately following the end of the conference (ISBN: 3-211-82963-6).

Structural environmental issues

It is almost given that the dual subjects of (a) information technology, and (b) travel and tourism, are subject to rapid environmental change. The IT area itself is changing at an ever increasing pace as new hardware and software technologies evolve. In parallel with this, and in my view partially as a result of this, travel and tourism are changing rapidly on their own accounts. So, when you put these two together, along with several major infrastructural changes that are about to descend upon us, you have a recipe for potential disaster. The infrastructural changes that I am specifically talking about here are the turn of the century, which itself has spawned several other related software time bombs, and European monetary union. Let's consider each in more detail:

- **The turn of the century** Also known as the Y2K issue (although this is not strictly correct because one 'K' is 1,024), this is something that will impact every area of every business and in fact anything that uses a miniature computer processor. I won't go into the details of what the Y2K issue is because I am sure that most people know all about it by now. Suffice to say that it is caused by legacy systems, which were developed in the 1950s, 1960s and even 1970s, only allowing two numeric characters for the representation of the year within a date field. The problem is: How will software applications process the contents of this year field, following the 1 January 2000? There is a very real danger that insufficient action is currently being taken to address the problems that may occur at the turn of the century as computer systems of all types process inadequate date fields.

  The problem is obviously far reaching, but let's consider the travel and tourism related issues. While many large companies have dedicated individuals or even whole teams to tackle the problem, small travel agents may not even be aware that a problem exists within their own offices. Many of these are still running old PCs based on the 486, 386 and even 286 Intel processor chips. Most of these will not process applications correctly that depend upon the date for their actions. In other words, most applications won't work properly after 1 January 2000. Even the latest generation of Intel's Pentium

and comparable chips from other hardware suppliers use something called a basic input/output system (BIOS), which may not be Y2K compliant.

One of the best ways for the travel industry to tackle these problems is to co-ordinate their actions with one of the professional trade bodies that support IT-related subjects. In the UK, two good examples are ABTA's ABTECH organization and the TTI, both of which are presented earlier in this chapter. These organizations can provide guidance on various software packages that can detect those elements of a computer system that are not Y2K compliant. Although these software packages are not 100 per cent accurate in their judgements on compliance, they do provide at least some guidance on whether a user's PC has a Y2K problem.

But the problem is far wider than just point-of-sale systems. It extends to any device that uses a computer chip to control its actions. This includes virtually all forms of transport, such as aircraft, trains and coaches, and also extends to devices used throughout the travel and tourism industries to control such devices as hotel lifts: and because the size and scale of software changes usually turn out to be at least double that originally estimated, time is fast running out for these changes to be made.

For example, the Y2K date problem is compounded by several other related problems. The date of 9 September 1999 will occur before the millennium and this may spawn problems of its own. This date translates numerically into 9/9/99, which was often used by early programmers to indicate an upper limit for a date field. Who knows what will happen when this date is reached? Then there is the added complexity introduced by the fact that the year 2000 is also a leap year. Under normal circumstances this might not pose a major problem for computer software but with the added Y2K issues, it could well serve to compound the problems faced by the IT community tasked with resolving this issue.

- **European monetary union** Although this may be put off for a few years, it will no doubt happen one day. But what if it happens during the year 2000? The scale of software changes throughout the industry would be enormous and would occur all at one time: these changes are in any event non-trivial. At the simplest level, they equate to introducing another completely new currency. At the highest level they represent an opportunity for companies in the travel and tourism sector to exploit the benefits of eliminating exchange rate fluctuations from their marketing and pricing activities. To some, however, this will be seen as a drawback because many companies derive a revenue stream from currency conversions that are an integral part of their business. I discuss the implications of the Euro in more depth in Chapter 8 – Financial Services.

So, the travel and tourism industries are both complex and subject to rapid change; and as I hope you will observe from this chapter, the industry is highly dependent upon IT for its success and profitable growth. Now, having reviewed the environment, it is time to move on to explore how IT is used in the field of tourism to foster travel by holiday-makers and business people, from both national and regional perspectives.

2

Tourism

Introduction

This chapter is dedicated to exploring the ways in which IT is used to support tourism. In my view, the two main factors that characterize tourism are: (a) information, and (b) marketing. Both factors rely heavily upon IT for their successful deployment. New technology can store and process information extremely efficiently. This means that information management is easier and less costly than it used to be several years ago. Marketing relies on information in the first instance to identify potential consumers, establish the need for new products and project future income streams. But marketing relies on IT in far more basic ways than this. Tourism in the modern era is highly dependent upon IT as a new media channel through which products and services can be distributed to individual consumers and companies. Take for instance the tourism life cycle:

1. **First stimulus** The very first stimulus to travel is pretty hard to identify accurately. From an individual's perspective, it could be as straightforward as an advertisement or television programme or it could be something as remote as a conversation with a friend who described a travel experience that appealed to the prospective tourist. However, it is increasingly possible that the first stimulus for travel may be attributable to the Internet; and this is a pure marketing tool for companies and countries wishing to promote their product or destination to potential travellers around the world.
2. **Information** Once a person has been stimulated to embark upon a trip, either for personal or business reasons, the first thing the person will be seeking is information that describes all aspects of the planned trip. Information on alternative travel arrangements and the destination itself is needed. In the early stages of the tourism life cycle, this information is almost purely concentrated on facts and figures that describe the destination for the visitor. Besides booklets, pamphlets and telephone conversations, this information can be conveyed in a number of new ways. For example, it can be recorded on compact disk lead-only memory (CD-ROM) disks and viewed on a PC, viewed on an Internet site or accessed via a self-service kiosk. The possibilities are extremely varied and set to increase over the next few years as technology becomes ever more sophisticated.
3. **Booking** Booking systems used to be the domain of the travel agent. However, with the growth of the Internet some booking systems are being distributed directly to consumers and large companies. Also, in the context of tourism, the most sought after products are bed and breakfast accommodation and tickets for local events. Both are now increasingly available from either tourist offices using computer systems supported by large data bases of supplier information or Internet sites that provide this information direct to the consumer.
4. **Travelling** Once the tourist embarks on the trip, IT is there once again to make the tourist's life easier. Airlines allow travellers to use self-service machines for check-in, air carriers offer passengers computer games and information displays, hotels offer their guests automatic check-in with in-room Internet access

and desk-top PCs, tourist offices provide self-service information machines, many of which also support accommodation booking services and payment collection.

I hope that from this introduction, you can see that IT is widely used in almost every part of the travel and tourism environment. Not only is it used so widely but many companies and organizations actually rely upon it for their profitability and success. I'll be covering the Internet in Chapter 5 so for the remainder of this chapter I focus on how IT is used to support tourism organizations both at the governmental level and at the local inbound/outbound level. I have taken the UK and Ireland as prime examples of how IT is being used to support tourism-related activities. Let's take the UK first of all and start with the British Tourist Authority (BTA).

The United Kingdom

The UK has a well established infrastructure to support and develop inbound tourism. There are three main components of this infrastructure: (i) the BTA, which promotes Great Britain as a destination to overseas countries and foreign visitors; (ii) the English Tourist Board (ETB), which promotes England as a holiday destination for domestic holiday-makers; and (iii) tourist information centres TICs, which are scattered throughout the destination locations of the UK and offer information and local booking services to tourists. I'll be describing each of these in turn, but let's start with the BTA.

THE BTA

The UK Government, like many others around the world, recognizes the value of tourism to its domestic economy. This is clearly illustrated by some basic UK statistics, for example: 23.6 million people visited the UK from overseas in 1995 and these visitors generated £12 billion of expenditure. By the year 2000, the BTA estimates that overseas visitors' spend in the UK will amount to £18 billion a year, 40 per cent more than in 1996. So, in order to promote Britain to overseas countries as a place to visit, the UK Government supports a dedicated body, i.e. the BTA.

The BTA's mission may therefore be simply stated as: 'to promote inbound tourism to the UK'. However, the supporting business objectives are more targeted than that. Some important sub-objectives are, for instance: (i) to increase the amount of money that overseas visitors spend while in the UK, and (ii) to encourage as even a balance of expenditure as possible, both geographically across the region and seasonally throughout the year.

In order to achieve its objectives the BTA deploys a considerable proportion of its resources on the collection and dissemination of information to consumers and to a variety of companies and organizations in the business of bringing visitors to Great Britain. Examples include inbound travel companies, parts of the UK travel trade, travel suppliers, business travel conference organizers, overseas tour operators and incentive travel companies. Consequently the BTA, like other tourism organizations, is a highly information intensive activity; one for which the opportunities offered by IT are particularly important.

Any discussion of the UK Government's tourism organizations must include both the BTA and its sister group, the ETB. These two organizations work hand in glove within the field of UK tourism. The ETB focuses primarily on encouraging domestic consumers to take their holidays at home in the UK, whereas the BTA's attention is very much on encouraging overseas consumers to visit the UK. Within the context of IT, both organizations share a common interest that is fundamental to their core promotional activities. This is the collection and dissemination of tourist information on the UK as a destination: because it is the ETB that plays a major role in collecting and vetting such information, this is a good place to start our review of IT within the UK's tourism promotion activities.

The ETB

The primary objective of the ETB, is to promote England as a holiday location for domestic consumers. The ETB accomplishes this not through marketing activities of its own but via strategic

partnerships and the development of jointly funded promotional programmes. A secondary, but equally important objective, is to raise standards of product/service quality throughout the industry in the UK. Also important to ETB activities is the feedback of information to suppliers on consumer likes, dislikes and views. Feedback such as this is vital to the development of new markets, products and services by travel suppliers.

The ETB achieves these objectives through ten regional tourist boards (RTBs) located around the country. Each of these RTBs is an independent autonomous company in its own right and is not controlled directly by the ETB organization. RTBs are usually formed as limited companies and derive their membership from local authorities and business people. It is always the case that one of the RTB board members is an ETB director. Generally speaking, the primary role of an RTB is to co-ordinate the local development of tourism in its area, but in the context of doing this it also supports ETB marketing plans and therefore is eligible to receive some ETB funding for these activities. Other RTB sources of funding are derived from membership of RTB and from commercial activities. One of the key roles played by the RTBs is the collection of information on local tourism products and services for use in promotional programmes and a variety of publications. I'll explain the IT-related aspects of this in more detail in a moment. But first, let's just consider the main items of UK destination information that are collected and stored in an unbiased way by the RTBs. These are as follows:

- **Accommodation** This is categorized into *serviced* and *non-serviced* accommodation. *Serviced* accommodation includes hotels and bed and breakfast locations, whereas non-serviced accommodation covers self-catering and rented cottages.
- **Attractions** There are over 5,000 attractions in the UK that range from theme parks, such as Alton Towers, to castles and stately homes. Both private and public attractions are included here.
- **Events** This includes specially organized activities or shows that either occur just once or are ongoing. Examples include The Chelsea Flower Show, millennium shows and village fetes.
- **Activities** In particular, English language schools are promoted as a source of incoming tourism. These may be either full-time or part-time courses at colleges or schools in Britain. Other examples are activity based holidays.

So, in summary, the ETB tries to encourage people to spend their holidays in their home country and the BTA encourages overseas visitors to come to the UK for their holidays. Thus, as you can see, both organizations are largely complimentary; and this is one key reason that they work so closely together. Another reason is that they both share a common interest in maintaining accurate and up-to-date information that describes the UK as a tourist destination. The collection and storage of information is therefore fundamental to the activities of both the BTA and the ETB; as well as, for that matter, any tourist organization. So, before we go any further, it is important that you understand how this information is managed.

Information

What the BTA and the ETB both have in common is a need for information that describes their home market, which is of course the UK. For historical reasons, it is the ETB that has spearheaded the collection and recording of information about England. The ETB accomplishes this in close collaboration with the geographically dispersed offices of the RTBs: this is where IT plays an important role in the promotion of tourism in England. In fact, IT is set to become the single most important critical success factor for both the BTA and the ETB in the medium to long term future. So, it is important to understand what information we are talking about here and how IT can be used to distribute this information to consumers and inbound travel companies in the UK and around the world, both now and in the future.

Let's start with the information itself. The ETB collects and stores a variety of textual data on some 40,000 hotels and other types of accommodation, 5,000 tourist attractions and 8,000 events occurring in the UK at any one time. It does this in close collaboration with the RTB, Fig. 2.1, as follows:

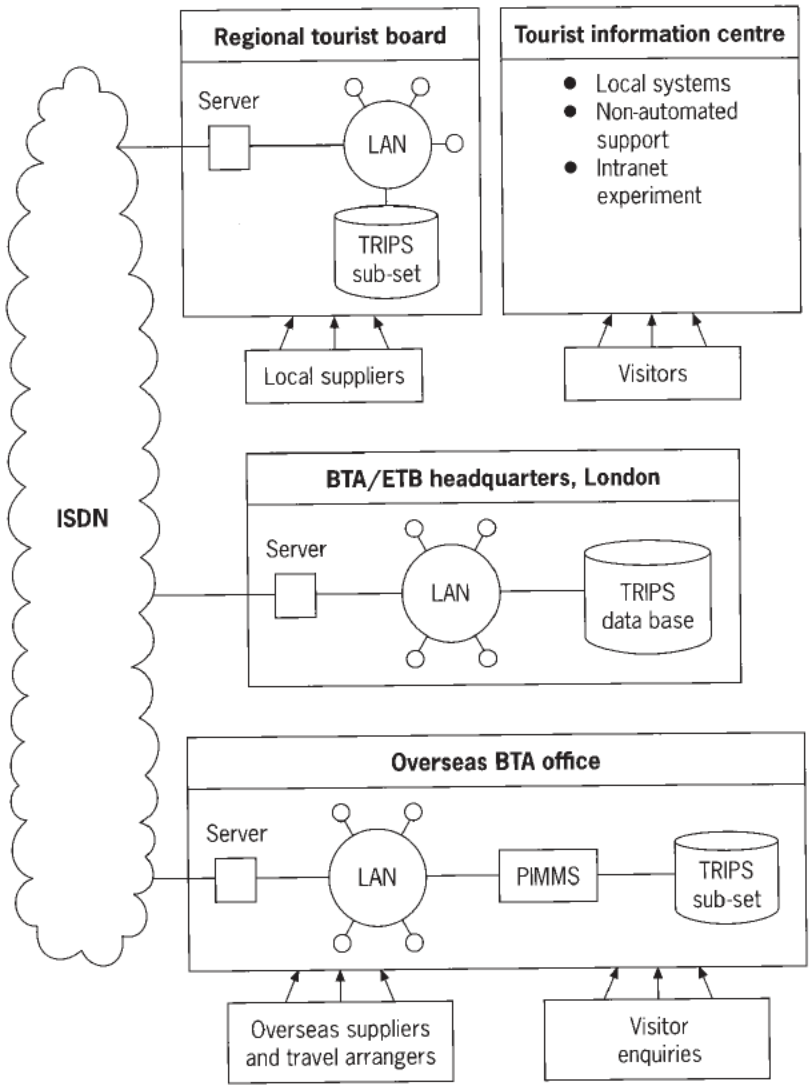


Figure 2.1 The UK tourism information network

- The information needs are determined and standard questionnaires for each type of data are designed and pro formas of these are distributed annually by the ETB to each of the ten RTBs. The RTBs pre-print the forms locally. They are designed to capture all items of pertinent information concerning an accommodation supplier, an attraction or event that is planned to be held somewhere in England. The objective is to collect this kind of information as close to the source as possible.
- The questionnaires are distributed to local suppliers for completion and returned to the local RTB office. All information is vetted by the local RTB officers who check the forms for correctness and ensure that data are presented in the appropriate 'house style'.
- Completed questionnaires are manually keyed by local RTB staff into their client/server local area network (LAN) based computer system, which contains a single region copy of the data base. Overnight, any amendments are uploaded via communication lines to the central tourism resource information processing system (TRIPS).
- TRIPS is the main component of the ETB and BTA's London head office system. This uses a client/server architecture with standard PCs as clients and multiple servers, one which controls a Novell based LAN and the other which

is the TRIPS data base server based on a DEC VAX hardware platform.

- The data collected from the RTBs are therefore input to a central application that performs validation checks before updating the central TRIPS data base held on the DEC VAX. This is an application written in a hierarchical data base language.
- The result of the RTB data collection exercise is therefore updated regional and central TRIPS data bases. Access to TRIPS is also provided to remote locations like the BTA office in New York, using wide-area network (WAN) technology and terminal emulation software (a Windows front-end is planned for 1998).
- The TRIPS data base also incorporates a flexible report generation facility. This can be used to generate customized reports on demand, for local printing. Overseas locations can receive extracts of the TRIPS data base for local processing on their own PCs.
- In addition to the regular annual updates (quarterly for events), described above, the information is also kept current by the RTBs on an ongoing basis. Each time an important change is detected, the software communicates the update overnight.
- Information on English language schools and activity holidays is stored on separate data bases. These small data bases, consisting of just a few thousand entries, are managed by the Microsoft Access software package.

The information used to create the TRIPS data base is used for many purposes. For example, sub-sets of the information are placed on the British Airways BABS system (see Chapter 3 for a description of BABS). This data is currently keyed manually from TRIPS into the DRS section of BABS (although more sophisticated update software is being planned). Other information systems are also under consideration by the BTA and ETB. These offer consumers an on-line 'searchable' data base facility (see Chapter 5 – The Internet).

Despite the fact that TRIPS has been developed over many years, it remains a cornerstone of Great Britain's tourism activities for two main reasons: (a) it is the only repository of up-to-date country-wide information on tourism in Great Britain, and (b) it has adapted to an increasingly sophisticated end-user population by the continual development of new and easy-to-use interfaces: over the years, this information has been recorded and disseminated in a remarkably consistent way. This data base has therefore been the underlying reason for much of the success of the UK's inbound tourism promotion activities since the early 1980s. Much of this success has been achieved because:

- Promotional publications are quick and easy to produce from a comprehensive and reliable source of information on the UK, e.g. leaflets, guide books, pamphlets.
- Sub-sets of the data base are held in most overseas BTA offices, thus allowing immediate answering of queries on the UK by, for example, telephone service centres.
- Information can be provided quickly and efficiently to overseas tour operators wishing to construct package holidays to the UK.

However, despite the clear evidence of this success it is nevertheless sometimes said within the ETB that it is still easier for a UK consumer to book a holiday in Spain than in the UK itself; and from the BTA's viewpoint, it is still difficult, for example, for a Dutch cyclist club to book bed and breakfast accommodation and other services in small- to medium-sized establishments (SMEs) over the course of a two week tour of the UK. There is therefore a pressing need for local UK products and services to be booked easily by the consumer and inbound suppliers. Although this is an issue that has vexed the BTA for many years, the Internet holds the promise of an ideal solution (see Chapter 5 for a review of tourism and the Internet). However, having said this, there are no plans for a commercial booking engine to be supported by any Great Britain tourism organization at present.

A related issue is: How can the BTA increase the level of support given to overseas companies to help them build package tours that include visits to the UK? The challenge for the British tourism organizations is therefore to use IT to communicate with consumers and provide interfaces with supplier booking systems. The following paragraphs explain just a few of the innovative IT-based initiatives currently under consideration by UK tourism organizations.

The teletourism experiment

A key challenge for the BTA and other tourist organizations is how to capitalize on the gradual integration of what has historically been two separate information storage technologies: (i) data bases of textual information, and (ii) libraries of graphical bit mapped images (including photos). In the new multi-media environment, however, some significant benefits can be derived from the shared organization of linked text and image data. This is required, for example, to answer disparate queries from consumers on a variety of subjects in a flexible way – sometimes to show a picture of any castles linked to say Arundel; at other times to show pictures of all Norman castles and where they are located in England. When these multi-media technologies are linked with the new high speed telecommunication technologies, some really interesting possibilities begin to appear.

One such possibility was the teletourism initiative that was funded by a European Community grant (Reference DG14 – the Communications Directorate of the EU). The overall objective was to seek ways in which IT could be used to enhance the interaction between central tourism organizations and their remote offices. Specifically, the grant was aimed at encouraging the growth of Europe's Integrated Services Digital Network (Euro-ISDN), which is now a telecommunications standard supported by the EC. However, at the time the experiment was commissioned, ISDN existed in several slightly different 'flavours' across Europe. It was hoped that experiments like teletourism would identify and therefore help resolve these wrinkles in the ISDN standards.

The experiment involved two information suppliers: the BTA and the tourist office for Tuscany in Italy. The idea was twofold: (i) to provide an information and booking service for tourists wishing to stay in London apartments, and (ii) to promote Tuscany villas and holiday homes to European tourists visiting Italy. Five remote user sites in Paris, Madrid, Brussels, Dublin and the British Travel Centre in Regent Street, London, could all access the system via ISDN communications technology. Visitors to these five European locations could request a tourist information officer to help them use the teletourism PC to browse a data base and possibly book accommodation (the system was not designed to be intuitive to allow consumers to use the system sufficiently themselves). On-line help desk support is always available to all users of the service during normal office hours.

In order to learn as much as possible within the constraints of a limited investment in time and money, only a small number of suppliers and locations were included in the experiment. This was accomplished by sharing information recorded on an on-line multi-media data base, using video-conferencing techniques and by providing a rapid response booking capability. Taking each component in turn:

- **Multi-media data base** Tourism officers in the five remote tourist offices used the ISDN link to access a searchable multi-media data base stored on the BTA's server in London. The end user (in this case the tourism officer), uses a map based graphical user interface (GUI) to specify the kind of property in which the consumer is interested. The search criteria may include several parameters such as the number of rooms, price, facilities, location, period of construction and many others. A drill-down facility enables a great deal of relevant information to be retrieved from the data base, which can be searched until a property of interest is found.

  Properties of interest to the consumer can then be listed and pictures of the apartments can be viewed. These are stored in a library of images on the BTA's London server. The images show, for example, a wide area map of Greater London; a local area street map; pictures of the exterior of a selected apartment; views of the inside, including specific rooms and views from certain rooms. Naturally, each image is accompanied by the relevant text that describes it in full. All images and text retrieved from the server, are transmitted to the remote overseas office and displayed on the local screen.
- **Video-conferencing** For more in-depth information, ISDN is used to support video-conferencing (see Chapter 6 for more information on video-conferencing). This allows the prospective tourist

to talk and see a person, i.e. a tourism information officer, at the remote end of the line in order to discuss requirements in more detail.

The video-conferencing link also supports some key interactive tools: (i) the shared use of resources such as a virtual 'white board', viewable by both the caller and called parties – this can be used, for example, to draw maps or diagrams; and (ii) the use of interactive form-filling and spreadsheet techniques to help develop ideas using work-group technologies.

- **Booking support** Finally, when the consumer (in this case either a traveller or a tour operator) wishes to make a booking, the system automatically records the booking information. This is then passed to an information officer at the London Tourist Board, where an actual booking is made. Bookings are currently made manually either: (a) via the telephone, or (b) using on-line reservation terminals in the London Tourist Board offices. Confirmations are faxed back to the end user in the remote tourist office.

The teletourism experiment was judged to be a success by its users. It was well received and consumers generally liked using it. However, in order for some real benefits to be derived, the system needs to be used more heavily. The only problem here is that the BTA's high volume of bookers for London apartments tend to originate in the USA and Middle East – both of which are of course outside the EC area and hence outside the scope of the experiment. But in terms of the original objectives, the experiment has: (a) identified a few small ISDN variations that in the end proved immaterial, and (b) demonstrated a working pan-European tourism application that made good use of ISDN technology.

The next steps in the development of this experiment are to extend the system to enable more of the TRIPS data base to be accessed, particularly other parts of the accommodation section. Also, it is recognized that for consumers and suppliers to derive real benefit, more supplier booking systems need to be automatically connected. Although this could be done via a communications switch of some sort, the resultant costs are expected to be high.

The BTA is therefore looking at other options, such as a 'booking by fax' service, which could prove to be more cost effective. This works by having the server automatically 'fill-in' an electronic form, based on the information entered by the end user as part of the dialogue. The electronic form is sent to the appropriate booking system and a reservation is made. Once confirmation is received, the computer automatically formats a fax message and transmits this back to the end user.

Although a 'booking by fax' service could well prove an excellent approach for larger suppliers that have their own computer systems, it is not always quite so suitable for smaller accommodation providers (sometimes known as SMEs). Most SMEs do not have computer systems that can automatically respond to electronic booking messages and many do not even have fax machines. However, it is the smaller guest houses and bed and breakfast locations that are often of prime interest to an overseas consumer. This is where the BTA faces a problem – it is not a commercial organization and is therefore not able to enter into the business of providing either a booking capability or a reservations service for these SMEs. However, it is within the BTA's remit to help and encourage such tourism related developments. One of the key IT-related issues that the BTA needs to address over the short to medium term future is therefore: How to support electronic bookings for SMEs?

There are many ways in which the teletourism experiment could be developed and extended. However, the real question is: What technology can best deliver comprehensive tourist information on the UK to consumers and inbound travel companies in all parts of the world and also support a wide range of supplier booking systems? The Internet is one obvious alternative that is worthy of some careful consideration. The BTA's use of this new channel is explored in more detail in Chapter 5.

Overseas BTA offices

From its headquarters in Hammersmith, London, the BTA is responsible for more than 40 overseas territories. Each of these is responsible for promoting Great Britain, which for the purposes of

tourism encompasses England, Scotland, Wales and Northern Ireland (by special contract), to both consumers and the travel trade in other countries around the world. The BTA's overseas offices vary enormously in size. There are two main types of office: a dedicated BTA owned and run office, and a representative office:

- **BTA owned offices** The largest of these is in the USA where the New York office employs 60 staff. This dedicated tourism operation houses a nation-wide toll-free telephone service centre with 15 staff and a high speed telecommunications line connecting it to the BTA's London head office. The transatlantic line provides New York with direct access to the TRIPS data base of tourism information on Great Britain. This technological infrastructure enables the BTA's New York office to support an average of 0.5 million calls per year. Other large BTA offices include Frankfurt and Paris, both of which employ approximately 20 staff.
- **BTA's representative offices** In smaller overseas markets, BTA uses representative offices that are often shared with other UK organizations. These offices are therefore not usually wholly owned or staffed directly by the BTA. In many cases these representative offices are independent companies contracted to the BTA for the supply of tourism services in their local market.

The focus of all BTA's overseas offices' efforts is very much on the provision of information to consumers and the travel trade: this information currently takes the form of paper-based publications that describe the UK to overseas visitors and suppliers in such a way that it does not favour any particular company or commercial activity. Many overseas BTA offices stock around 300 brochure titles, each of which describes a specific region and/or aspect of the UK in a particular language. The cornerstone of this two pronged promotional activity is the BTA's public information mailing management system (PIMMS).

PIMMS

This is a purpose-built system originally developed by the BTA in 1989 using Borland's Paradox programming language, for running under Microsoft DOS. It has since been re-developed within a Microsoft Windows 95 operating system environment using the Access data base product with Visual Basic as the programming language. This new version is being Beta tested, i.e. as at mid 1997, and will be rolled out to all BTA offices. WinPIMMS has been developed for Windows 95.

Over the past six or seven years, PIMMS has become a powerful marketing and promotional support tool for the BTA. It may be customized and configured for different countries. PIMMS is used by all overseas BTA offices to: (a) fulfil requests for information on Great Britain as a destination, and (b) capture marketing information to support future promotional activities. PIMMS is used as follows:

- Operators receive incoming telephone calls or walk-in visitors to the BTA office in another country. Most of these enquiries may be satisfied by sending the caller a brochure. These operators use a PC that has the PIMMS software loaded and running. The main menu comprises the following options:
  - *New request* Enquiries are divided into two main classes: (i) those received from consumers considering visiting the UK, and (ii) those from travel trade companies constructing inbound travel products to the UK. PIMMS provides customized support for each type of enquiry, as follows:
    - *Consumers* Consumer details are keyed into PIMMS by the operator. The operator enters a check mark against the publications that seem most relevant to the consumer's enquiry. The system also records marketing information such as the consumer's interests, where he/she saw the BTA advertisement and some demographic information. Finally, the consumer's name, address and other contact details are captured.
    - *Travel trade* PIMMS enables the BTA offices to build up local data bases containing full contact details of all major travel trade suppliers in their countries. The operator is provided with a variety of selection parameters that can be used to access the data base and select the

appropriate company. Once selected, the process is similar to that described above for consumers. The operator enters the relevant details that describe the company's enquiry, while at the same time capturing many items of useful marketing information. The company data base also allows the operator to track the number of brochures requested to-date.

For both types of enquiry, the operator may access a range of information on UK locations, products, suppliers and services. These are all stored locally by PIMMS using information derived from the TRIPS data base.

- *Request query* This function is used to investigate a consumer's claims that information previously requested has not yet been received. The original request, as logged by PIMMS, can be viewed.
- *Labels* Mailing labels for affixing to envelopes may be selected, sorted and printed onto special stationery.
- *Business* This is a marketing support function and allows the PIMMS data base of contacts to be segmented and analysed in detail.
- *Archive* Old contact information may be removed selectively from the PIMMS data base and transferred onto floppy diskette. This frees up space on the PCs hard disk yet allows the information to be kept off-line for possible future use.
- *Maintenance* This allows data base items to be viewed, modified, deleted or added. Examples of data that may be maintained in this way are travel company profiles and the brochures that are available for distribution.
- *Events* This is the scaled-down version of the TRIPS data base and describes UK-based special events that are displayed in date or location sequence.
- *Accommodation* Similar to the above, this is a sub-set of the TRIPS accommodation data base and shows a wide range of hotels and SMEs.
- *Exit* Allows the user to close PIMMS down and exit from the system.

- At some pre-determined time during the day, the operator may request the PIMMS system to print mailing labels, a personalized letter and a picking list of paper-based promotional material, e.g. brochures. This is used to mail the appropriate brochures and other material to the enquirer.

As mentioned above, an extract of the TRIPS data base is stored within the local PIMMS system. This sub-set of TRIPS is crucial to the system's effectiveness. Periodically, a special extract of the TRIPS data base is taken and either: (a) transmitted from London to the overseas BTA offices by e-mail, or (b) stored onto floppy diskette and mailed to the overseas BTA offices. In either case the information received from head office is entered into the local PIMMS system. This process is undertaken quarterly for those items that describe UK events and annually for the 30,000 or so items that describe accommodation suppliers. Other categories of information are being considered for PIMMS including: UK attractions, activity holidays and English language schools.

Physical information distribution is a key issue for the BTA. The reasons for this are: (a) brochures cost a great deal to design and produce; (b) the logistics required to support brochure fulfilment are considerable, e.g. obtaining stocks from a central supplier, storing supplies of brochures locally, organizing and fulfilling promotional mailings; and (c) the cost of mailing brochures to consumers and trade contacts is a significant expense. For these reasons, the BTA continues to investigate other approaches to promotional efforts. These include centralized fulfilment and use of the Internet (see Chapter 5 for a more detailed evaluation of these opportunities).

PIMMS can also be accessed by other means including, for example, telephone voice response systems and consumer activated kiosks. Automated voice response systems support unattended brochure requests. The way this works is as follows. First of all, the PIMMS system is linked up to the telephone via a purpose-built voice response computer loaded with special software. Incoming calls are automatically answered by the voice response computer that controls the dialogue with the caller. Callers use their telephone keypad to select options from a spoken list. The end result of this dialogue is a brochure request that is logged by the PIMMS

computer, just as though the call had been taken by a human operator. Similar but more sophisticated techniques are being considered that involve housing the PIMMS system and its human interface within a multi-media kiosk. This would then be used by walk-in clients of the BTA office or possibly passers-by in a public area, depending upon where the kiosk is situated.

However, in all cases, the BTA uses available technology to the greatest extent possible in each country. For example, overseas BTA offices use their in-house ISDN service to communicate with London and other sister offices. Also, other PC software packages are used including Autoroute for road journey planning and British Rail's timetable data base, which is stored on CD-ROM. Additionally, fax-back technology is currently used by the BTA in Tokyo, Los Angeles and New Zealand.

So, as you will have gathered from this brief overview of the technologies used by the BTA, it is an IT intensive activity. Like so many other tourist offices around the world, information is at the heart of everything the BTA does; and much of the information used by the BTA, which is in fact gathered and recorded by its counterpart the ETB, is also used by TICs.

TIC

The national UK Government is not the only public body to recognize the importance of tourism to the economy. Local authorities have also recognized how important it is for a local community to attract visitors to their area. The vehicle to support inbound tourism to an area of the UK is the tourist information centre (TIC). There are over 540 TICs in England. In most cases, they are independent bodies but they are usually either run by local authorities or are at least heavily influenced by them. There is an enormous variety of TICs, ranging from a small mobile van to a high street shop front. The ETB sets certain standards for TICs that, if met, allow them to participate within the TIC network and use its standard branding. So, although the ETB can influence the TICs, the ETB has no direct control over their activities.

Given this local sphere of control, it is not therefore surprising that TICs are very responsive to local needs. However, on the other side of the coin two basic problems lurk: queries from tourists who are travelling from place to place in the UK are difficult for TICs to answer satisfactorily; and (ii) there is precious little standardization of information storage methods used by TICs, from a national perspective. Let's consider each problem in turn:

- **Local/national information** The tourists who visit TICs usually require information about local events or accommodation. But there are also many who are visiting the TIC location as part of a grand tour of the UK (or at least a regional tour). These people require not just information on the locality but also on items such as: how to plan their itinerary, where to go next, how to book their next accommodation stop and what attractions to visit outside of the TIC area. Unfortunately, TICs do not have access to the BTA's TRIPS data base and have to rely on paper-based publications for such information.
- **Technolology** The technology used within TICs has been extremely focused on meeting local needs. For example, within each TIC there are often one or more local information and booking systems that cover the surrounding area's products and services. The aims of these systems are to increase the level of bookings and to encourage tourists to use the region's suppliers. Consequently the number of disparate systems used within the TICs around the country have grown like topsy. Most have been independently developed without any overall standards or a common technical architecture.

The ETB's challenge is therefore to capitalize on the various local systems used by TICs and thereby provide access to the TRIPS data base of UK products and suppliers. With so many different TIC systems out there, this poses a real problem. However, in 1989, the ETB identified a key opportunity to do something about this challenge by encouraging TICs to adopt a common standard for information recording and retrieval. This is how the ETNA initiative was launched.

ETNA

The objective of ETNA was to establish a common standard for the recording of information

used by TICs. Although the ETB has no direct control over the TICs, it does have considerable influence on their activities. This influence arises primarily from the TRIPS data base, which is owned by the ETB–BTA and would be extremely useful to TICs. If only some way could be found to distribute the TRIPS data base to all TICs on a periodic basis, then this would enable them to provide an enhanced level of service to tourists.

The general approach used by the ETB to pursue the ETNA initiative was: (a) to commission the development of a standard information retrieval program that would run on most of the TICs existing PC equipment, and (b) to distribute the TRIPS data base among the TICs on a periodic basis. This is how it was done:

- A special purpose program was written in a fourth generation computer programming language called Paradox (marketed by a software company called Borland). This was developed as a prototype application and supported functions such as data base load, data base update, information retrieval and printed reports.
- The ETB identified three or four computer re-sellers with whom to work in collaboration. This entailed: (a) the ETB providing the re-seller with the Paradox application software together with a sub-set of the TRIPS data base on floppy diskette, and (b) the re-seller marketing this packaged service to each TIC.
- A common standard was agreed for recording a sub-set of the TRIPS data base on computer files. This sub-set contained all of the information that was relevant to the TICs and was structured using Paradox data base tools. So, some standardization was achieved and this enabled the system re-sellers to import TRIPS data and update their data base systems. This in turn enabled them to maintain the data and sell the packaged system to their customers.

The ETNA initiative was all about standards. So, in the final analysis, although the system worked, and is still providing a useful service to over 150 TICs, the standards setting objectives were not totally achieved. The main reasons for this were: (i) there was little consistency among the TICs in terms of technology – some TICs were even using unsupported systems, and (ii) the re-sellers were too small and either could not devote the necessary resources to promote and develop ETNA further in-line with technological progress. However, the experience gained as part of ETNA was to prove invaluable to the ETB when it came to consider the opportunities offered by the new technology paradigm – the Internet (see Chapter 5 for more information on this topic).

THE CANTERBURY TIC

Having set the scene for TICs, I thought it might be helpful to examine an actual TIC in more detail. The Canterbury TIC is a good example because first of all, it is a pretty typical TIC and, secondly, it has participated in the ETB Internet experiment (see Chapter 5 for more details). It is a very busy TIC, which handled 308,216 visitors over the period April 1996 to March 1997, and is located in the city centre, close to the Canterbury Tales visitor attraction. The main visitors' service area is located on the ground floor and other departments, including the accommodation booking service unit, are on the two floors above.

The Canterbury TIC is a private company that is a wholly owned subsidiary of the Canterbury Chamber of Commerce. The historic building that houses the TIC offices are provided by the city council which also subsidizes the operation with a grant covering approximately 25 per cent of outgoings. However the TIC is still responsible for all other expenses that arise from its operations. The Canterbury TIC is an information provider that has two main customer populations: (i) outbound travellers who are residents and local businesses interested in UK destination areas serviced by other TICs; and (ii) inbound visitors from outside the local area, including other TICs and overseas tourists, who are interested primarily in the Canterbury area. The terminology I have used for the remainder of this section therefore refers to inbound tourists to Canterbury and outbound tourists travelling to other parts of the UK. Let's take each type of tourist in turn and examine the services that the Canterbury TIC provide.

Residential and local business information services

The primary revenue earner, and the service that is growing fastest of all, is the accommodation

booking service that is located on the first floor of the Canterbury TIC. This provides information and booking services directly for local accommodation and via other TICs for destination visitors. Taking each in more detail:

- **Inbound visitors** These usually comprise potential visitors to the city who wish to stay locally. Most of these requests are received over the telephone from other TICs and from walk-in visitors. However, the Canterbury TIC also receives direct contacts from customers who either telephone or send their inquiries by fax, post or e-mail.
- **Outbound visitors** These are visitors who may, for example, be touring the country and stopping off at other UK locations as dictated by their own flexible itineraries. These people usually visit the Canterbury TIC in person to arrange their accommodation. The TIC network offers a very popular service called book a bed ahead (BABA), to meet this requirement.

Naturally, the Canterbury TIC has specialist knowledge of accommodation services within its own locality. The office maintains its own detailed data base of hotels, bed and breakfast houses and many other hospitality suppliers within the Canterbury area. Much of this information is stored on a PC using a simple word processing application. This is used mainly to support the inbound accommodation business. The Canterbury TIC can, however, also book accommodation for outbound tourists who wish to stay anywhere in England, Scotland, Wales or Northern Ireland, via its links with other TICs around the country. Links that are prime candidates for the effective deployment of computers and telecommunications. But before we can consider how new IT can be used by TICs to support their inbound and outbound accommodation businesses, it is important to first of all understand the current booking process in more detail. This works as follows:

- Customers may contact the Canterbury TIC by either: (a) walking into the office if they are in the locality; (b) if they are in another part of the country, requesting their local TIC to telephone Canterbury; or (c) telephoning themselves directly. They give details of what accommodation they are seeking to the Canterbury TIC representative. The accommodation supplier is sought in the following ways:
  - *Inbound visitors* The Canterbury TIC representative will consult the local file of hotels and bed and breakfast establishments. A dialogue with the visitor enables a choice to be made and a telephone call to the proprietor usually secures the required accommodation.
  - *Outbound visitors* For immediate departures to outbound areas, the TIC representative will contact the servicing TIC in the destination area by telephone. Some TICs will not take advance bookings and will only deal with customers who wish to book for the current or next day's stay. The Canterbury TIC representative will advise the remote TIC of the customer's requirements.
- At this point, the customer may be asked to either wait in the office or call back later while the accommodation required is sought, booked and confirmed.
- For outbound visitors, it can be two hours or more before the remote TIC calls back to advise details of the booking that have been made for the customer. Sometimes the information is faxed back to the Canterbury TIC.
- The Canterbury TIC receives confirmation of the accommodation and provides the customer either with a locally produced booklet supplied by the hotel or a copy of the information received from the remote TIC.

This process is both cumbersome and labour intensive and is not conducive to the efficient handling of high numbers of enquiries. Over the period April 1996 to March 1997, for example, the Canterbury TIC received 25,864 contacts from visitors by mail, telephone and other means. Attempts have been made by other TICs to overcome these problems as part of the ETNA initiative (see above section). ETNA attempted to encourage third party computer companies to develop information systems based on the TRIPS data base format, for use by TICs around the country. This was, however, only partially successful and not all TICs could afford the investment in this new technology. Another unfortunate problem was that the

initiative resulted in at least two incompatible systems: the CTV system and the Integra system. Despite the fact that both systems can use a version of the TRIPS data base for their information feeds, they are otherwise incapable of being linked or shared between TICs. However, the Canterbury TIC uses no such system at present.

The long term aim is to replace these third-party systems and the manual processes used within non-automated TICs, with a new system based on Intranet or Internet technologies. At present, the ETB is experimenting with an Intranet service that has the potential to automate many of the information servicing functions performed by TICs (see Chapter 5 for a description of the ETB's Intranet experiment). A final version of the experimental Intranet system could eventually be used to replace much of the above telephone-based processes between TICs. A customer's requirements, whether for inbound or outbound services, would first be understood by the TIC representative. The representative would then select the appropriate part of the country from the ETB's Intranet data base using simple menus and search engines. The details of accommodation alternatives could either be described to the customer or a print-out of the relevant pages could be given to the customer. Along with this, a map page showing how to get to the area desired and how to find the accommodation shown, could be produced. However, in terms of booking the accommodation, no alternative has yet been identified to using the telephone. This is primarily because, although an on-line booking system would be quite possible from a technical angle, the commercial and practical issues have not yet been resolved fully by UK tourism organizations.

At present, the ETB's experiment has provided only a single PC that is available for use by the Canterbury TIC staff on the ground-floor servicing area. Because this currently operates rather slowly and is shared by all staff, it has not been possible to process the high volumes of enquiries that were originally expected of the experiment. However, exposure to the functions provided by the experimental Intranet system has enabled the staff within the Canterbury TIC to appreciate the opportunities that are possible with this type of technology. Given an improvement in the system's performance and availability, some substantial benefits could be realized in terms of reduced time and lower telephone expenses. The only possible downside in this new IT-based environment would be some loss of human expertise and knowledge of local accommodation situations. Such knowledge can really only be learned easily by talking to an expert.

Besides accommodation services, visitors and residents need to know what national and major events are taking place around the country in destination areas. At present, the Canterbury TIC stores details of destination events on its PC word processor, which also incorporates a diary facility. Storing information in this way has a number of benefits: (a) it is relatively simple to maintain the information; (b) selected data can be printed and given to visitors; and (c) due to its simplicity, the system can be used by most TIC staff to service their inbound customers with very little training. However, ready access to local information on events in other areas around the country relies almost totally on reference documents. Other TICs and local authorities, for example, publish information booklets on events and places of interest within their local areas, but these are only distributed locally. The only exception to this is London events, which are more widely circulated. The ten regional tourist boards publish major events in their brochures, which are distributed across the country. Then there is a book called *BTA Events* that covers the whole country and is issued to all TICs. Finally, there are approximately 30 booklets that cover events and places of interest, e.g. historic houses and gardens, that are part of the TRIPS reference kit. All these publications are all stocked within a central library by the Canterbury TIC. This is the main reference source that enables TIC staff to answer customer's enquiries such as: What's on in specific geographical areas around the country?

Again, the ETB's Intranet experiment supports an events section that has the potential to replace the use of the reference library. The problem is that usage of the Intranet for events is subject to the same kinds of problems that I mentioned above, i.e. slow system response and limited access to the PC; and because it is perhaps even more essential for a system to deliver immediate

responses to enquiries for information on events, the Intranet is seldom used in this area. Nevertheless, exposure to the Intranet experiment has enabled the Canterbury TIC staff to appreciate fully the opportunities offered by the Intranet. There is common agreement that provided: (a) the practical problems mentioned above can be solved, and (b) funding levels can be increased to meet the required IT expenditure, then the Intranet could be an effective answer to a TIC's event servicing problems. This could improve customer service times while simultaneously reducing a TIC's expenditure on items such as the printing and distributing of local event booklets.

Visitors

The second major information servicing function performed by the Canterbury TIC is provided to inbound visitors to the Canterbury area. Enquiries are received from all corners of the world by the Canterbury TIC. For example, in response to tourists' enquiries the TIC mailed over 10,000 Canterbury guides to people who asked about the area last year and in June received just under 1,000 letters and 4,000 phone calls. Over 200,000 Canterbury accommodation guides were distributed in 1997. At present only a handful of e-mail enquiries are received each day, although this is expected to increase with the launch of the VisitBritain site (see Chapter 5). Looking to the long-term future, the VisitBritain site could enable many of these enquiries to be satisfied by the customers themselves, always providing the site contained up-to-date and comprehensive information.

One of the most time-consuming tasks for the Canterbury TIC is booking local accommodation for walk-in customers, telephone callers and requests received from other origin TICs around the country. At present this is handled manually via the telephone. Looking to the future, a solution that has been identified by Canterbury TIC's staff is the 'touch vision' system currently being used in Ireland. This system provides an automated booking service with payment processing functions. It can be implemented either as a self-service automated teller machine (ATM) type machine or via a TIC operated PC. Public access systems (PAS) such as this have significant potential for TICs like the one in Canterbury. The initial thrusts for PAS like this are thought to be mainly: (a) to provide after-hours customer servicing functions, and (b) to support Internet bookings. However, the main obstacle is the investment required to purchase the hardware and system software.

Given a booking system such as this, TICs could use it to provide event booking and ticketing functions. The PAS would need to be capable of storing allocations for certain popular events, e.g. London shows. However, for local events and festivals, the Canterbury TIC usually holds its own ticket stock. There are substantial benefits to be gained from automating event ticketing. For example, a single book of event tickets can be worth £6,000 or more. The manual control of this kind of value poses risks and processing costs that would be largely eliminated if an automated system could be used, especially one that is accessible directly by customers using some form of self-service machine.

In summary, the Canterbury TIC, like its sister TICs around the country, is an information service that is highly labour intensive. There are significant opportunities for these TICs and the services that they offer visitors to be streamlined using new technology. The ETB's Intranet experiment has enabled some of these opportunities to be identified, but before it can be considered a practical tool for widespread use by TICs it needs to address the following basic problems:

- The response times need to be quicker by far. TIC representatives typically have just one minute to deal with a customer's enquiry. Any 'point-of-sale' system must be substantially quicker to use than a reference book.
- The PCs providing the Intranet or Internet service must be readily accessible to all TIC servicing staff on the front counter.
- The information service must be permanently on-line so that TIC representatives do not have to set up a communications link and log-on to the Intranet each time they have an enquiry. The experimental service currently times-out and this causes much annoyance to users.
- The unit costs of the service should be fixed and not time-based because this is a disincentive to more widespread and frequent use within

the TIC, which has to operate within a very tight budget. TIC representatives need to feel relaxed about browsing the information on the data base in order to answer a customer enquiry.
- The information service needs to support the building of a customer itinerary that can then be routed to other TICs for booking purposes.
- A full staff training plan, involving all TIC servicing representatives, needs to be given prior to the information service being implemented.

The BTA and ETB organizations are well aware of these and other issues that have arisen from the Intranet experiment. They have already addressed many of them during the development of the VisitBritain site. The remainder will only be addressed by greater investment in IT among TICs. However, given the stringent expenditure levels of many of these organizations, such expenditure will have to be offset by savings in other areas, increases in revenues and/or a demonstrably higher level of customer service. In my view the approach being taken by the UK tourism organizations in tackling these issues will deliver sound results in the future. The necessary expenditure offsets to the investment required are readily identifiable in terms of: (i) staff time savings; (ii) reduced brochure printing and distribution costs; (iii) increases in the volume of inbound tourism expenditure; (iv) reduced losses incurred as part of event ticketing; and (v) improved customer servicing, e.g. high quality printed maps and personalized itineraries.

Ireland

Tourism is vital to the Irish economy. In 1995, for example, 4.2 million people visited Ireland and as a direct result of this, their visits generated around I£1.5 billion in foreign earnings. Tourism in Ireland represents over 6.4 per cent of gross domestic product (GDP) and supports employment for one in every 13 workers. It is not therefore surprising that the Bord Failte Eireann, i.e. the Irish tourist board, and the Northern Ireland Tourist Board (NITB) have focused their attentions on increasing the numbers of inbound tourists and the resulting yields in the field of tourism. One prime example of a strategic initiative that makes excellent use of IT is the Gulliver project.

Gulliver is the name given to an initiative aimed at promoting tourism to the island of Ireland. Its goal is to establish an infrastructure that can provide the main channel of distribution for information and reservations on all major aspects of tourism in Ireland. More specifically, Gulliver's objectives were:

- To make it easier for tourists to choose Ireland as a destination.
- To improve visitor servicing while in Ireland.

Gulliver was developed as a joint venture between Bord Failte Eireann and the NITB. It was funded from a variety of sources including Bord Failte Eireann, the NITB, the International Fund for Ireland and an EU development grant. Following a technical feasibility study, Gulliver was developed over the period 1990 to 1991, piloted in early 1992 and went live later that same year. It has grown to become a leading example of how IT can be used to support the development of tourism for a country. However, this has not been achieved without some considerable growing pains. We can learn a lot from how Gulliver was developed, so let's start with an overview of how the original base system was constructed.

THE ORIGINAL GULLIVER SYSTEM

Gulliver is Ireland's national tourism information data base, which is used by the travel industry and by visitors to learn all there is to know about Ireland and its services. Virtually all sectors of the tourism industry play important roles in Gulliver and enjoy the benefits of this state-of-the-art system. Participants are drawn from each major sector, i.e. accommodation suppliers, tour operators, tourism offices and tourists themselves.

The structure of Gulliver mirrors that of virtually any major travel-related distribution system. It has a large data base at its core that is fed with information supplied by service providers and their systems. The products thus focused at the centre are then distributed to end users via various technologies and channels. Let's take each element of the Gulliver system in turn, as it was originally developed in 1991 (Fig. 2.2):

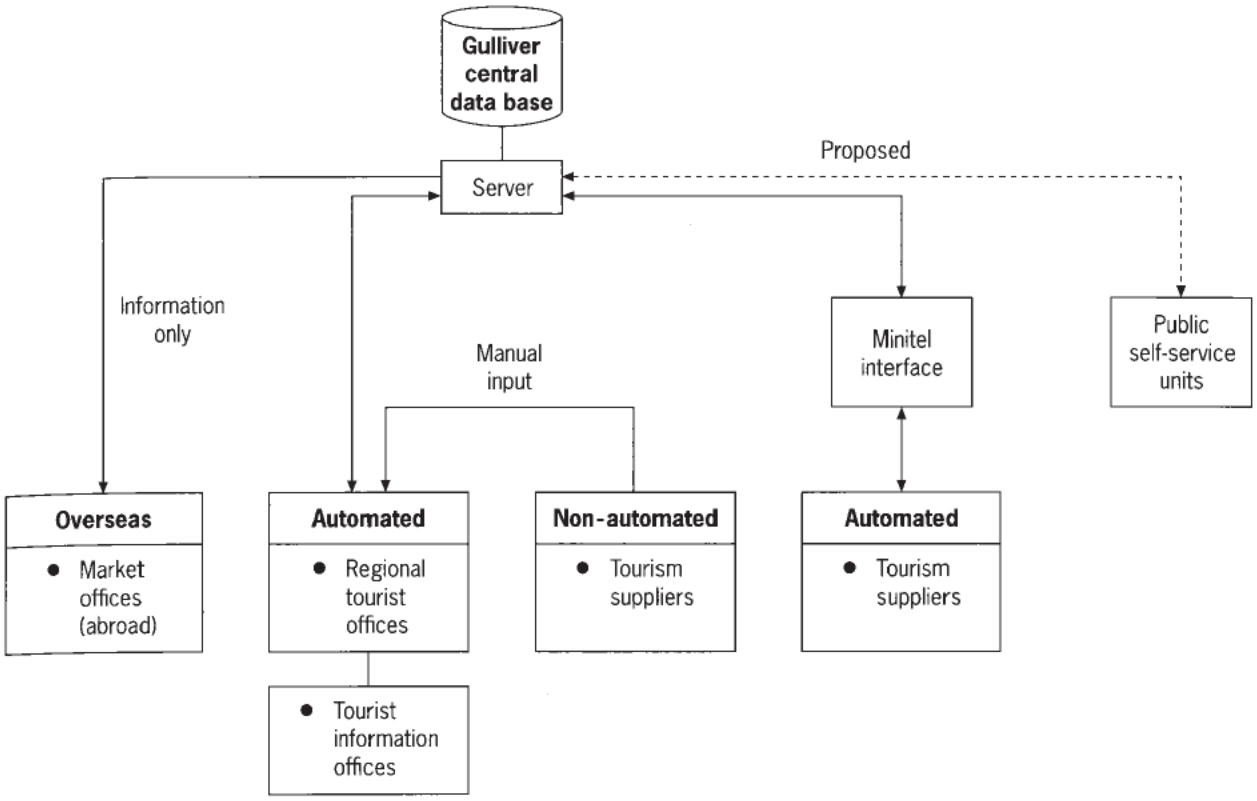


Figure 2.2 Gulliver's original design

- **Data base engine** At the core of the original Gulliver system was a powerful data base engine, driven by a Digital Equipment Corporation (DEC) VAX 6320 computer. This server platform was used to store all tourism related information about Northern Ireland and Eire. This information covered all 32 counties of Ireland and included: all properties approved by the tourist boards; calendars of upcoming events; general destination information, e.g. attractions, places of interest, restaurants, pubs, night-life and cultural events; specialist activities and services; useful contact names and addresses; sports and leisure facilities; a route planning facility, including maps and route details; and finally, tourist attractions. Detailed information on all of these subjects was stored on the Gulliver data base. The data base was distributed on-line to Gulliver's population of users in Ireland and around the world.

  Ireland's accommodation suppliers are small and widely dispersed with few multiple chains. Over 85 per cent of all accommodation units are SMEs, each with fewer than 30 rooms on average. The range of styles and facilities is consequently enormous, which means that the data base will always be large and highly dependent upon an efficient search engine.
- **Suppliers** Gulliver stores details on a wide range of suppliers, which fall into the following major sectors: (a) accommodation – all approved hospitality providers, including hotels, guesthouses, bed and breakfasts and self-catering; (b) premises – supplier information on prices, descriptions, directions, facilities and nearby attractions; and (c) transport services – including bus and rail schedules. To participate in Gulliver, an approved accommodation supplier must pay an annual fee that is inclusive of membership of the respective tourism organization as well as Gulliver itself. SMEs pay only an annual Gulliver membership fee that is related to the type and size of their premises. However, these fees are relatively low and

amount to less than I£300 per year, even for the largest of properties.

Accommodation suppliers that are registered by the Bord Failte Eireann will automatically be included on the Gulliver data base. The information shown about each will include facilities, location and contact details. However, rooms are not available for on-line booking purposes unless the supplier is a Gulliver member. Each Gulliver member may register their property on either a request or an allocation basis:

- *Request* A supplier may simply provide a narrative description of the rooms on offer. However, these may not be booked automatically by Gulliver. To make a booking, tourist offices and other outlets must somehow contact the supplier directly to check availability and request a reservation. This is usually done over the telephone and can be long-winded, laborious and costly. It also makes the premises less attractive to intermediaries, for booking purposes.
- *Allocation* A supplier which is a Gulliver member may allocate a specific number and type of rooms from its inventory for Gulliver to onward sell directly to prospective purchasers. The supplier decides the number of rooms, the room type and the dates during which they are available. Gulliver also provides suppliers with a great deal of flexibility in terms of the date ranges and associated room rates for which allocations are displayed. For example, a higher number of rooms can be shown as available for a reduced price during periods when bookings are known to be low. The allocation method is preferred because it allows a purchaser to check availability on-line, make a reservation and obtain an immediate electronic confirmation, direct from the supplier (NB: advance bookings are confirmed by post).

All bookings originating from tourist offices are subject to a 10 per cent commission fee. When a booking is made in a tourist office, the visitor pays a minimum of 10 per cent of the total price, as a deposit. The tourist office retains its commission from this deposit and pays the balance where appropriate to the product supplier. Bookings made by tour operators are voucher based. The transaction value, which is not shown on Gulliver, is based on pre-contracted rates agreed between the two parties, i.e. on the one hand to the accommodation supplier, tourism product provider or in either case, their marketing representative and, on the other hand, to the individual tour operator.

No matter what type of participation is chosen by a supplier, the information is provided to Gulliver either electronically or manually. Electronic supplier information can be keyed into videotex terminals that feed Gulliver, or updates may be transmitted direct from certain property management systems (PMSs) owned by suppliers, i.e. the leading two PMSs in Ireland. Non-automated suppliers provide information to Gulliver offices over the telephone, fax or by letter, where they are keyed into the system.

- **Distribution channels** The tourism information recorded on Gulliver's central data base by Irish suppliers is distributed to end users by a variety of means using several different technologies. These end users are located both domestically and in international markets:
  - *Domestic* Gulliver's end users in Ireland include regional tourism organizations, TIC and, in the future, tourist activated kiosks located in airports, shopping centres, ferries and other transport terminals. The focus here is on providing inbound tourists with the information they need to travel around Ireland, assimilate the culture and use the services of domestic suppliers.
  - *International* Overseas, Gulliver's end users in the international area include: (a) the market offices of Irish tourist boards located in key foreign countries; (b) GDSs, such as Sabre, Galileo, Worldspan and Amadeus, that distribute Gulliver to travel agents selling bespoke holidays to independent travellers to Ireland; and (c) videotex systems, such as Minitel in France and Prestel in the UK. Overseas tour operators also use the information stored in Gulliver's central data base to help them build packaged holiday products to Ireland.

Originally, direct access to Gulliver was provided by dumb terminals connected to local controllers located in the end users' offices. These terminal controllers were themselves connected by leased data lines operating at 9600 b/s, to regional DEC Microvax minicomputers. Each regional mini was then connected via a high speed data line to the Gulliver central host system.

The original Gulliver system was introduced in 1992. It was rolled-out to suppliers and users in both the domestic and overseas markets. Gulliver's store of local, regional and national tourist information was available 24 hours each day, 365 days of the year. For the first time it provided prospective tourists to Ireland with advance planning and itinerary assembly facilities as well as on-line booking functions. Then, in 1994, following a period of two years' operational use, a review of the Gulliver system was undertaken. This enabled several technological problems to be identified:

- **Poor end-user performance during peak times** During the peak summer season the volume of transactions processed on the central Gulliver computer was extremely high. This placed a heavy burden on the host DEC VAX computer and provided end users with slow response times to their enquiries.
- **High telecommunications costs** The dedicated high speed data lines used by Gulliver were very expensive to install and run. These lines had a high fixed monthly rental that did not vary with regard to the volume of traffic carried. A related problem was the dependency upon these lines. If one failed, it affected a great number of users and prevented access to many parts of the Gulliver system.
- **Obstacles to international roll-out** A combination of poor performance times and high telecommunication costs meant that it was not attractive to extend Gulliver to overseas tourist offices, and this was precisely the key area where Irish tourism needed to concentrate.
- **Minitel problems** Suppliers did not take to the French Minitel system. One of the main reasons for this was that suppliers in Ireland did not embrace Minitel nor, for that matter, any other kind of technology. The result was that Minitel was only used for accessing Gulliver occasionally, when a supplier's data needed updating. There were two main consequences: (a) users quickly forgot how to use the system and a high ongoing training cost was incurred by Gulliver, and (b) the usage pattern also gave the impression that Gulliver was more costly than it really was. If, for example, suppliers had been using Minitel for other purposes, then the data line costs would have been spread over several applications and would not have been laid solely at the door of Gulliver.

  The end result was that Gulliver became unpopular with smaller Irish suppliers who were the very people the system was aimed at. After a short while SMEs reverted to making telephone calls and sending facsimile messages in order to communicate updates to the regional tourism centres. The consequences of this were that manual workloads increased and information could only be updated during normal office hours.
- **Out-dated technology** The original Gulliver system used a simple text-based approach to recording, storing and displaying information. However, rapid developments in new technologies, such as multi-media, CD-ROMs and the Internet, made Gulliver look increasingly out-of-date. What was ideally needed was a GUI that provided high quality images, graphics, sound and even video. But given Gulliver's legacy systems architecture, such a change in approach would put a further burden on the already over-worked central computer.

In summary, the review concluded that from a technological viewpoint, a centralized on-line system was not appropriate to achieve the objectives of the project. Subsequent investigations into Gulliver's data storage patterns and access profiles also revealed an interesting picture. The data stored about suppliers could be segregated clearly into static and dynamic elements. Static data represented around 90 per cent of the Gulliver data base and described a supplier's products and services. This type of data hardly ever changed but was accessed a great deal. Dynamic data represented far less in terms of volume because it

described supplier's availability and rates. However, dynamic data was accessed only infrequently, i.e. when an actual booking needed to be made. This was one of the most significant findings of the review and its resolution became a cornerstone of the new Gulliver system.

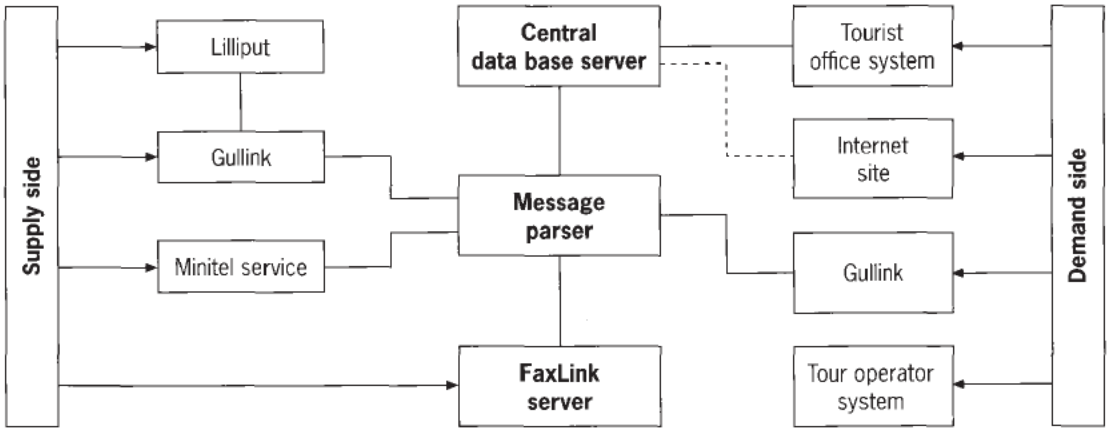
THE NEW GULLIVER

The re-engineered Gulliver system was re-launched in 1996 and is still being enhanced and rolled-out around the world, i.e. as at mid-1997. Gulliver uses IT to link the supply and demand sides of Ireland's tourism industry. The supply side comprises service providers and the demand side is the marketplace. It is, however, the supply side that is particularly important to a tourism organization. Gulliver's supply side has the linkages to update allocations received from suppliers, keep prices up-to-date and receive both booking notifications and cancellations from users on the demand side. It is sufficiently flexible to support the wide range of automation options adopted by service providers in Ireland. For example, Gulliver supports service providers that use: (a) their own individual systems, e.g. Gullink, see below; (b) PC-based systems, e.g. Lilliput, again, see below; and (c) no automated system at all, e.g. dumb Minitel terminals and FaxLink. A diagram of the new Gulliver system is shown in Fig. 2.3.

The common factor that both the supply and demand sides share, is a data base of tourism information. This data base, which is the cornerstone of Gulliver, is controlled by a powerful server. One of the most important components of this server is its message router (sometimes also known as a message processing engine), which is the name given to the software used to control the server's dialogue with the outside world. It does this via several communications technologies that are supported by Gulliver, e.g. X25, ISDN, leased lines and PSTN or dial-up. The message router incorporates mailbox features and acts as a single source of information for the central system and also serves as a destination for all incoming messages. This allows external users with a variety of systems, e.g. Minitel, FaxLink, Lilliput and Gulliver, to communicate via message pairs with the Gulliver central system. The message router also provides a firewall that insulates the central system from on-line users thus protecting the integrity of the data base and providing the required degree of security needed by Gulliver. The technical architecture around which Gulliver is built may be summarized as follows:

- A single master data base that is maintained centrally in the Gulliver headquarters. This is updated via information received from a variety of sources by forms or e-mail. Quality control procedures safeguard the information that is applied to the master data base.
- Copies or snapshots of the data base, i.e. static copies, that are distributed to users periodically (usually daily). This allows users to store their own local version of the Gulliver data

Figure 2.3 The re-engineered Gulliver system



base and thereby enjoy fast response times to enquiries.

- Direct access to the data base is limited to specific 'as needed' cases. In other words, users only connect to the central system to update static data; submit queries to the dynamic data base, e.g. availability requests; and process certain transactions. They do not access the central data base for on-line information queries.
- Transactions are processed as electronic messages that fall under certain classifications: (a) price and allocation changes that originate in PMSs and from Minitel terminals, used by accommodation suppliers; (b) booking and cancellation notifications; and (c) availability and booking requests. A front-end mailbox is used to control the processing of these messages.
- Links to the data base server are effected using a variety of communications methods including leased lines, ISDN, X25 and PSTN, i.e. dial-up.

The original centralized approach was therefore replaced by a distributed client/server architecture. This uses Microsoft NT 4.0 for the networking functions and SQL Server data base software to provide a new interface to Gulliver's central information repository. This new approach minimizes telecommunications costs and reduces the load on the central server. The development tools used during the construction of the Gulliver system are shown in Table 2.1. The application functions are generally partitioned as follows:

Table 2.1 The tools used to develop Gulliver

Development area	*Tools used*
Operating system	Microsoft Windows NT
Data base	Microsoft SQL Server Microsoft Access ODBC Compliant Stored procedures
User interface	Microsoft Visual Basic Microsoft standards
Programming	Microsoft C++
Local data base update	SQL Server Replication
Remote management	Microsoft SMS

- **Client functions** In this context, 'clients' are PCs located in demand centres, e.g. tourist information offices, tour operators and suppliers. These demand centres use PCs to access locally stored static data. A tourism information office will, for example, browse the locally stored static data base of products that are of interest to a customer (or tourist). This data base is stored either on the user's PC itself or on the office's server, i.e. if there are several PCs in a single office. Several properties and services may be viewed and discussed with the tourist in this way before availability becomes an issue. When an availability enquiry needs to be made, the central dynamic data base held by the Gulliver central system is accessed.

  Client PCs interact with the host Gulliver data base server using standardized message pairs. Messages may be of four main types: (i) enquiry messages that request the server to look up an availability of a particular property; (ii) response messages that are in effect answers to previously sent enquiries; (iii) changes to centrally held supplier data that is assembled on client PCs and sent to the server by service providers, and (iv) messages sent from the central system, which update the locally held data base of static supplier information. This makes the dialogue between the client and the server particularly efficient; and because the client site pays only a local call to access the server, costs are minimized. A family of special software products has been developed to support this messaging protocol. Two of these are branded Lilliput and Gullink, and their functions are summarized as follows:
  - *Lilliput* The Lilliput software has been designed for installation in supplier's client sites where PMSs are used. It enables supplier systems in remote locations to dial into the central site, gain access to the message router and exchange information with the Gulliver data base server.
  - *Gullink* This is a communications library featuring an application program interface (API), which is used to connect remote host computer systems to Gulliver's message router. It is available in both DOS and Windows

Table 2.2 Gulliver's main functions

Core functions	*Supply side linkages*	*Demand side linkages*
Maintenance of the Gulliver data base	Maintenance of prices	Query processing of the accommodation data base
Replication of data base changes to outlying user sites	Maintenance of allocations	Query availability
Maintenance of availability information for supplier products and services	Receipt of bookings	Processing of bookings
Processing of transactions, i.e. message pairs	Receipt of cancellations	Query tourist information
		Route planning

versions and runs on any PC that uses a 386 or higher specification processor.

When a booking is made, Gulliver sends a notification message to the accommodation supplier. This is done via the central system mailbox, which formulates and transmits an electronic message containing the booking details to the hotel PMS. This is effected in most cases by means of dial-up communications from the Gulliver centre to the hotel location.

- **Server functions** Only when a user requires availability information or a when a booking needs to be made, is the central system accessed. When this occurs, the local PC uses ISDN or several other telecommunication options to contact the central server. Once connected, the client PC exchanges enquiry messages with the server. This usually results in a response being received by the client PC within eight seconds – far better than with the 'old' system. If the desired supplier service is available and needs to be booked, Gulliver responds with a confirmation number and this can be quoted to the customer: in the future, Gulliver will be accessible from overseas locations via the Sprint telecommunications network. The major functions of the Gulliver central system are as shown in Table 2.2.

  As described above, the server does not actually process clients' enquiries in the classical real-time on-line sense. Instead, it uses some special purpose software to control server operations, similar to a kind of EDI protocol that supports ISDN, X25, PSTN or leased line access. This software controls the set of standard electronic message pairs, each with a specific purpose, e.g. bookings, cancellations, changes, as described above. Messages are processed on the server and the corresponding response is returned to the originating client PC in a standard format. In time, it is planned that Gulliver's messaging system will comply with the UNICORN standards (see Chapter 1 – The TTI). When this happens, it will be far easier for overseas tour operators to exchange bookings and cancellation request messages automatically with Gulliver. An inherent part of this software is a high level of security that prevents unauthorized access to the central Gulliver system. Gulliver's availability checking routines work like this:

1. The booking criteria are received as an incoming message from a user's workstation. This booking message comprises a set of general search criteria specified by the user. The search criteria may include, for example, date that the service is required (or date range), the number of people in the party, the sharing preferences, the *en suite* preferences and whether or not an accommodation plan that includes dinner is required.
2. Gulliver selects a sub-set of products from its data base that meets the stated requirement criteria.
3. If the accommodation units are not specified then Gulliver matches the customer's preferences on the number of people in the party, the sharing option and the *en suite* option.

4. Gulliver then searches the selected subset for the availability of accommodation within the highest preference combinations.
5. If a date range has been specified then the search is based on a combination of the number of days required and the start day.
6. The search continues until at least 20 alternatives are available. Once this has occurred, the availability options are examined for features that match the price and 'dinner inclusive' flags as set by the original enquiry.
7. The search results are formatted into a response message that is transmitted to the end user, e.g. the tourist office system, and displayed on the end-user's workstation.

The server also replicates the central data base so that multiple copies may be distributed and stored on regional servers. All tourism data is first received and stored on the central Gulliver data base. Once validated, the static element of this data is then available for copying and distribution to remote users. The central data base comprises a multi-processor Pentium PC with random array of inexpensive disk (RAID) storage – a technology that provides mass storage with a high level of data security and integrity.

In terms of supplier access, although Gulliver still supports Minitel, it has migrated many domestic suppliers to a PC-based solution. This works in the same way as described for the client environment (see above). Suppliers can use their PCs to dial into Gulliver's central computer and exchange booking messages. The software used by suppliers may be run as a stand-alone communications application or it may be embedded within third party software packages. This facility allows the Gulliver messaging protocol to be linked directly into the major PMSs used by accommodation suppliers throughout Ireland.

For the lower end of the SME supplier population, Gulliver also supports a fax-back service branded 'FaxLink'. For low volume users such as this, standard pre-printed fax forms are used by suppliers to record changes in allocations and rates. These forms are similar to national lottery 'playslips' and simply require pre-printed boxes to be hand-marked with a black pen. Once completed by hand, the forms are faxed to a central Gulliver collection point. Here, the fax forms are electronically scanned and the images thus recorded are transmitted into Gulliver where they are automatically processed. This involves Gulliver forming a response to suppliers on subjects such as reservations needed, cancellations or amendments.

Gulliver provides a comprehensive customer support service to all its customers whether they be large hotels, small bed and breakfasts, tourist offices, self-catering providers, hostels or cruising companies. The Gulliver Helpline is available on a local call rate and is manned by trained staff from 9 a.m. to 6 p.m., Mondays to Fridays in the Republic of Ireland and 9 a.m. to 5 p.m. in Northern Ireland. However, during the summer peak season, the Helpline is manned from 9 a.m. to 9 p.m., seven days a week.

The new Gulliver system was successfully piloted by a group of seven tour operators (two in Ireland, four in the UK and one in France). Once the concept had been proven, the entire system was converted to the new architecture and rolled out first to Northern Ireland's tourist offices and then to Eire's in time for the 1997 holiday season. The Gulliver system now forms a key component of the current re-branding and promotional campaign for Ireland as a tourist destination. This itself has fostered a new set of tourism initiatives, many of which are based on the Gulliver infrastructure, such as:

- **Multi-lingual call centres** All promotional material on Ireland will feature a localized freephone number. Callers to this number will be automatically routed to an Irish based multilingual call handling centre that will operate seven days each week. Operators in this centre will use the Gulliver system as its core technology to handle customers' enquiries, check availability and make reservations. The centre will also back-up major advertising campaigns to establish brand images and promote Ireland in the years ahead.
- **Public self-service kiosks** Kiosks, similar to ATMs, will be able to use Gulliver's new technology. These machines will operate on the same distributed client/server architecture as the Gulliver core system. Each kiosk will store a

copy of the static data base in order to support local enquiries. It will also provide other functions, including a credit card reservations facility. It is, however, planned that these kiosks will be operated by independent commercial companies and that added value will be generated via advertising, multi-media and virtual reality facilities. Locations under consideration include airports, ferry ports, railway stations and even the inbound ferries themselves.

- **Expanded information** The information stored on the Gulliver data base will be broadened to include a comprehensive calendar of events; listings of restaurants; well-known pubs; night-life; sports and leisure activities; suggested sight-seeing itineraries; information on transportation schedules, including bus and rail timetables; a five day weather forecast service; and a route planning service with geo-referenced data to display exact locations. All such information will be checked for completeness and accuracy by a new quality control system linked to the regulatory functions of the tourist board.
- **Minitel in France** Although the use of Minitel by Ireland's suppliers was disappointing, the system is nevertheless widely used throughout one of Ireland's leading inbound markets, i.e. France. In fact Minitel is the most widely used electronic distribution channel in France. Bord Failte Eireann have therefore supported the plans put forward by an international reservations bureau, to make Gulliver available via France's Minitel population.

Finally, the most important issue facing the future of Gulliver is that of ownership. This issue was first identified by Bord Failte Eireann following a strategic review that concluded that Gulliver should focus its efforts more acutely on the promotion of Ireland as a destination, to other countries. This has resulted in a downsizing exercise and the outsourcing of many non-core activities. However, it has nevertheless been recognized that the Gulliver project urgently needs additional resources to continue its development.

In an attempt to meet both of these strategic imperatives, Gulliver is in the final stages of seeking a business partner that will provide both financial and technical resources to the project. The intention is that this partner will purchase a majority share-holding in Gulliver thus effectively privatizing the project. This will allow the Gulliver team to: (a) continue developing the system, and (b) establish its place as one of the leaders in the field of electronic tourist information distribution systems. The commercial focus of the re-formed group will also protect Gulliver's investment in IT and thus help drive the Gulliver project forward into the future.

Other tourism support systems

Technology is being used in some very innovative ways to support and encourage tourism. Besides the information-based systems described above, countries are beginning to use IT to increase the productivity of their inbound tourism endeavours. A prime example of this is Australia's recently introduced automated visa application system, i.e. its electronic travel authority system (ETAS).

AUSTRALIA'S ETAS VISA SYSTEM

An often overlooked aspect of IT in tourism is border management technology. This can be an important factor that supports the costs effective growth and development of tourism to any country. After all, tourism can be encouraged by many factors and being able to obtain a visa quickly, easily and efficiently in the origin or outbound country is an integral part of this. Likewise, the processing of travellers through customs and immigration at inbound airports is both an important tourist servicing factor and an opportunity to reduce operating costs for the authorities involved. A particularly good example of a country that has tackled this area very successfully, is Australia.

All travellers to Australia, other than Australian and New Zealand citizens, require a visa or approval to travel and enter Australia. So, if tourism is to be encouraged it is essential that visitors and potential visitors can easily obtain their visas with the minimum of fuss. Because most visitors to Australia arrange their trips via travel agents, it is these intermediaries that bear the brunt of any red tape encountered by their customers. The old paper-based standard approach, which has

been used for many years now, entails the use of a paper form that must be completed by the potential visitor and mailed to Australia House. A central clerical operation must then open envelopes, check application forms, use on-line government systems to verify immigration records, issue a visa slip (for inclusion in the visitor's passport) and finally, mail the completed documentation back to the applicant. In many cases the visa application is a step that many people either forget or leave to the very last minute. Consequently many potential visitors to Australia often begin their journey with a trek to London for a spot of queuing at Australia House to apply in person. All in all, quite a lengthy and laborious procedure.

The ETAS system was initiated by Australia's Department of Immigration and Multicultural Affairs (DIMA). The DIMA's objective was to issue visas to all potential visitors to Australia as quickly and efficiently as possible with the goals of modernizing visitor flows at inbound gateways, supporting tourism and maintaining the integrity of Australia's borders. This was becoming especially challenging with the growth in visitors to Australia. For example, over the period between 1980 and 1990, Australia's short-stay visitors grew from 905,000 to more than 2.2 million per year. In 1996 over 4.1 million tourists arrived in Australia; a further 10 per cent more in 1997. More significantly, the Australian Tourist Commission and the Tourism Forecasting Council predicted a growth to 6.9 million visitors each year by the year 2001. This translates to 4.7 million visas, which is almost double the 2.6 million visas issued over the period 1994 to 1995. Clearly a new approach was necessary if the high number of visitors was to be supported without jeopardizing the integrity of the universal visa system and avoiding increases in cost.

The new approach embodied several principals. First, the visa issuance process needed to be seamless and virtually invisible to the prospective visitor. Second, it needed to maximize the number of visa issuing points around the world. Third, it needed to streamline the outbound airline check-in procedures and the inbound customs and immigration processing tasks. Finally, the new system needed to be efficient and reduce the overall cost of maintaining the visa system for Australia. To do this, DIMA worked closely with travel agencies and airlines to determine their processing requirements and especially with about 120 agents that have been issuing visas under special agreement with the Australian Government. DIMA also wanted to use the existing technological infrastructure for the design of the new system.

The Australian Government has simplified all this and has introduced an automated visa application system called the electronic travel authority system (ETAS). It is a revolutionary new way of obtaining the necessary approval to visit Australia using a combination of the GDSs, a Societe Internationale de Telecommunication Aeronautiques (SITA) computer system located in Atlanta and an Australian Government computer system in Sydney. Application forms are no longer required for an electronic travel authority (ETA) and, being electronic, there is no physical representation of an ETA. In other words, the visa is purely electronic and does not appear as a visa label or a stamp in a visitor's passport. This solution enables ETAS to be used by many of the 80,000 or so IATA registered travel agents around the world, and the system is quick; the actual ETA issuance process takes just ten seconds.

The ETA streamlines both the outbound and inbound parts of a traveller's journey. When a traveller has been issued with an ETA by his/her local travel agent, the first time it is used is when the traveller checks in at the departure airport. The airline carrying the passenger on the outward leg of a journey enters the ETA reference details into the departure control system. This link enables check-in staff to verify that the passenger has a valid visa; and because airlines can be fined for carrying a passenger who does not have a valid visa for entry to Australia, this is a significant benefit to the airline.

The ETA also streamlines the processing of inbound passengers when the flight lands in Australia. In fact, ETAS more than halves the processing time for visitors arriving in Australia. Immediately after their flights land at an Australian international airport, the visitors will present themselves at an Australian immigration counter. They offer their passports to the immigration clerk. The visitors' passport numbers are entered into a Government computer and the computer checks

to ensure that an ETA exists on the data base. If it does and the details check with the passports submitted, then the visitors are waived through. If any discrepancies are detected, a somewhat more lengthy process then commences (which I will not go into here). So, the ETA and its associated visitor's passport number, is a critical item of information upon which the success of the whole ETAS system is based. ETA data are logged by the Australian immigration computer via an ingenious three-way link-up using global communications networks.

The ETAS system comprises three inter-linked functions, each of which is supported by computers that are located in different parts of the world: (i) a front-end ETA application processing system supported by a travel agent's chosen GDS or CRS, (ii) an international data collection and routing system based on a SITA computer located in Atlanta, and (iii) a data base look-up and electronic funds transfer system supported by the Australian Immigration Department's computer in Sydney. No new hardware is needed by either the travel agents or the airlines involved. Let's take each one in turn:

- **The GDS PC front-end** ETAS is accessed via any one of the major GDSs and several CRSs. The travel agents use their terminals to access the TIMATIC data base (see Chapter 4 for a description of how GDSs use TIMATIC and what this information source is). Once into TIMATIC, the travel agents enter a special code, depending upon the type of visa required by the traveller. This could, for example, be either a visitor's or tourist's visa, a long-stay business visa or a short-stay business visa. Then, depending upon the type of visa, a special electronic form is displayed on the GDS PC screen. This has several fields that must be completed by the travel agents. There are two important facts to bear in mind here:
  1. ETA electronic visas are only available for certain nationalities. However, the list of countries supported by ETAS is very comprehensive and caters for the vast majority of Australia's inbound visitors.
  2. The ETAS system must be supported by the airline in which the visitor's passenger name record (PNR) is held. This is because the airline will need to have the functionality to communicate with the external computer systems that deliver ETAS via the travel agents' GDSs.

  Once all fields on the GDS electronic form have been completed, the travel agent ends the transaction. This causes the electronic form to be sent via the GDS network to the SITA host system in Atlanta, USA. There are two items of information that are critical to ETA applications: (a) the visitor's passport number and (b) the visitor's nationality. It is these two items of data that determine a passenger's authority to travel at the arrival and departure airports in Australia, as described above. These fields must therefore be entered again by the travel agent in order to verify their accuracy. So, the travel agent's customer does not even have to visit the agent's office personally to obtain their visa. The whole process can be undertaken over the telephone, with the travel agent using a GDS terminal to enter the information and obtain the response from ETAS.
- **The request capture system (RCS)** The principal role of the SITA host computer in Atlanta, USA, is to support the message handling aspects of ETAS. It receives all ETA transactions from originating point-of-sale GDS PC terminals used in travel agencies around the world. The SITA host performs some initial checking of the transaction format and then routes the message to the Australian DIMA computer in Sydney, Australia.
- **The request processing system (RPS)** Computers in Sydney and Canberra process and check all ETA applications from travel agencies and other visa application points around the world. The RPS receives each transaction and firstly checks the data fields using a variety of verification routines. When the transaction has been verified as OK, the computer then performs: (i) an on-line DIMA data base look-up to determine the status of the visitor for immigration purposes; and (ii) for certain types of visa application, a funds transfer that is effected via links to remote credit card computers for the payment of visa fees. A suitable response is formulated and transmitted via

SITA and the GDS where it appears on the travel agent's GDS PC.

Approved ETA requests are shown on a screen that includes the following fields: today's date and time in Australia, the expiry date of the ETA and a message denoting 'ETA approved'. When a visitor already holds a current visa or ETA, the system will respond by giving full details of what is held on the immigration data base. The travel agent has the option to use this as the current authority to travel or replace it with a new one. Besides issuing ETAs, other ETAS functions supported are: (a) help – the entry of a question mark in any field will result in a response that explains how that field is completed; (b) enquiry – if a visitor's passport details are entered, ETAS will respond with a full status report showing whether or not an authority to travel exist; (c) history – the principal use of this function is to reverse a credit card payment for a long-stay business ETA within 36 hours of it being initiated; and (d) check-in – this can be used to see if any specific passenger of any nationality has a valid and current authority to travel in Australia.

This new tourism supporting initiative has been a great success. ETAS was introduced in Singapore, North America and Japan where it proved popular with visitors and travel agents. Approximately 60 per cent of all travellers out of Japan are now issued with ETAs. The UK, Ireland and other Western European nations started using the system in late 1996 and early 1997. This area represents about 20 per cent of inbound tourists to Australia and the number is growing by 10 per cent each year. By the end of April 1997 approximately 63 per cent of all visitors to Australia had access to an ETA prior to taking their trip. This was as a result of ETAS covering some 20 nationalities and about a dozen airlines.

The electronic processing of visas is highly efficient for the traveller, the travel agent, the airline, airports and also for the overseas offices of Australia's DIMA. The traveller may obtain an ETA from wherever the passenger purchases an airline ticket without having to complete an application form. The travel agents becomes a one-stop shop providing their customers with an instant service involving virtually no bureaucracy and administration. Airlines are able to verify passenger visa details on check-in thus avoiding fines and can issue emergency ETAs themselves to last minute travellers. Airports benefit from faster clearance of passengers through customs and immigration with a consequent reduction in the demands placed on airport resources. Finally, Australia's DIMA offices are able to process visas using less staff, which reduces operating costs and ultimately helps lighten the financial burden on Australia's taxpayers.

Australia plans to extend and enhance its border management technology even further into the future. Australia is planning to make ETAS available via a dedicated PC linked directly to the SITA computer, thus by-passing the GDS and CRS reservation systems. This is aimed principally at large organizations that do not necessarily have access to a reservation system. Also, plastic card technology is being considered as a solution to streamlining processes at the border. The Australian business Access (ABA) card is designed to be an 'added value' product for visiting business people. The card embodies a machine readable strip that assists holders in being streamed into priority zones at arrival airports in Australia. This card may eventually be used to support additional automated customs and immigration functions. Likewise, the APEC business card is also being evaluated as a means of promoting business mobility within the Asia Pacific area. It is intended to be used as an entry authority by accredited business people from participating APEC countries. In 1997 the APEC card was introduced on a trial basis for Australian, South Korean and Philippine nationals. The APEC card will also simplify entry procedures by streaming holders into lanes at airports.

3

Suppliers

Introduction

This is the chapter that describes the technologies that travel industry suppliers use for their own in-house automation and, increasingly, as their platform for product distribution to the travel and tourism markets. Many of these systems have evolved over time from their origins in peripheral back-office areas like administrative support, accounting and inventory control. They have been continually refined and developed until they now represent what is arguably a supplier's primary marketing capability. Suppliers are increasingly using these systems as a platform to distribute front-office customer servicing, sales support and data base marketing activities. Supplier systems have therefore become a critical resource upon which many companies now depend. It is important that you gain a good understanding of the different kinds of systems and how they are used by suppliers, before we start exploring how they are distributed to intermediaries and consumers in the following chapters.

Airlines

This section describes how airlines use IT to support flight operations and control seat inventories. Inventories are important because they represent the core product of an airline that is sold by their sales offices and by intermediaries, such as travel agents, to consumers and businesses. Understanding how they do this is a fundamental step towards gaining a full knowledge of GDSs and other distribution technologies that are covered in a later chapter of this book. The core technology used by airlines is known generically as the CRS. Most airlines now use IT to control all aspects of their operations including flight schedules, load and balance calculations, revenue analysis and crew scheduling. These computer systems also supports seat reservations and ticket printing functions, which are the prime focus of this chapter.

THE AIRLINE BUSINESS

It has been said that the airlines bring the world closer together, unite people, broaden their experiences and expand trade; and so, the potential market for air travel is huge. Having said this, the airlines have only recently emerged from the industry's worst ever decline in volume and profitability, which resulted from: (a) the economic recession experienced by most of the major industrialized nations of the world, and (b) an intensification in competition between airlines. However, this is now well behind us and many airlines are now becoming more profitable.

It is the increased level of competition that has made life really difficult for the airlines. This competition has been brought about by the progressive deregulation of air travel in the USA, Europe and other parts of the world. Incidentally, the policy of deregulation is also sometimes referred to as 'open skies'. Deregulation removes many of the bureaucratic restrictions on fare setting and makes it easier for airlines to fly new routes. This has the dual effect of increasing competition and reducing fares: it is the downward pressure on fares that has been at the root cause of many airline failures. As a result of this, there has been

Table 3.1 The world's top airlines (1996)

Rank	International		Domestic		Total global	
	Airline	Pax*	Airline	Pax	Airline	Pax
1	British Airways	26.6	Delta Airlines	89.6	Delta Airlines	97.3
2	Lufthansa	20.1	United Airlines	70.1	United Airlines	81.9
3	American Airlines	16.7	American Airlines	62.6	American Airlines	79.3
4	Air France	15.6	US Airways	55.4	US Airways	56.6
5	KLM	12.8	Northwest Airlines	43.5	Northwest Airlines	52.7
6	Singapore Airlines	11.8	All Nippon Airways	36.8	All Nippon Airways	39.4
7	United Airlines	11.7	Continental	31.9	Continental	35.7
8	Japan Airlines	11.2	TWA	21.3	British Airways	33.1
9	SAS	11.0	Japan Airlines	18.3	Lufthansa	33.1
10	Cathay Pacific	10.9	Japan Air System	17.8	Japan Airlines	20.9
11	Alitalia	10.7	America West Airlines	17.6	Korean Airlines	23.6
12	Northwest Airlines	9.1	Korean Airlines	16.1	TWA	23.3
13	Thai Airways	8.1	Lufthansa	13.0	Alitalia	23.1
14	Swissair	7.9	China Southern Airlines	12.9	SAS	19.7
15	Delta Airlines	7.6	Alitalia	12.5	America West Airlines	18.1
16	Korean Airlines	7.5	Ansett Australia	11.8	Japan Air System	17.9
17	Iberia	7.1	Alaska Airlines	11.1	Air France	16.4
18	Air Canada	6.9	Qantas	9.8	Qantas	16.0
19	Qantas	6.1	Malaysian Airline System	9.0	Iberia	15.3
20	Malaysian Airline System	6.1	SAS	8.7	Malaysian Airline System	15.1

* Ranked in millions of passengers per year
(*Source*: IATA members' rankings 1996: Top 20)

a fair amount of consolidation within the airline business as carriers seek to exploit economies of scale and acquire new routes. It has also seen the emergence of global mega-carriers with the size necessary to compete for business around the world. Table 3.1 shows the relative sizes of the top airlines as at 1996.

All of these factors have emphasized the need for airlines to respond ever faster to market dynamics: one of the key ways in which airlines are able to do this is by the effective use of IT from which has sprung the CRS and the GDS.

THE AIRLINE CRS

The term CRS seems to have crept into use like so many Americanisms (perhaps that is one itself!). It simply stands for computer reservation system and is the term used to describe the technology that controls an airline's seat inventory for sales, marketing and ticketing purposes. Now, you may also have come across the term GDS. Well, a GDS is simply a network that distributes one or more participating CRSs in different countries around the world. But more on GDSs in Chapter 4: for the moment, let's try to understand how a single airline CRS works.

The introduction to the airline business in the first part of this chapter should have demonstrated that selling airline seats is a complex business. This should have enabled you to begin to appreciate some of the complexities faced by airlines in controlling the sales of seats on their aircrafts. The only practical way of achieving this level of

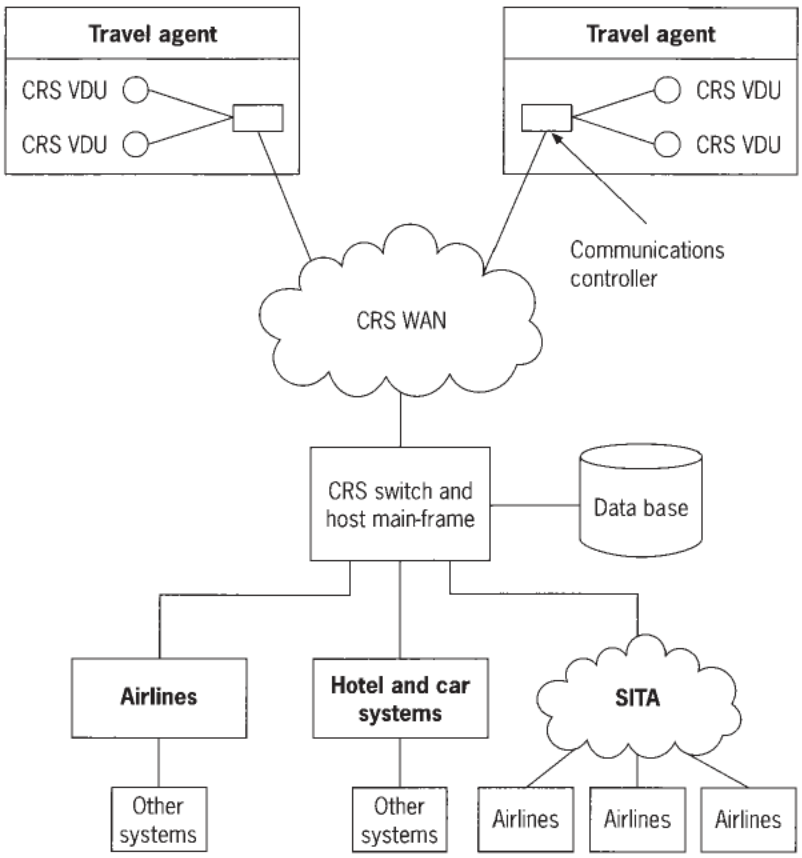


Figure 3.1 Diagram of a typical airline CRS

control is by the use of IT. This means using a large central computer to do all your processing, using a large central data base to store all the seats and their status, and providing access to the computer and data base via a wide area communications network. It is this combination of technologies that is known as a CRS.

Airline CRSs are an example of true legacy systems. These systems were the pioneers of computer applications in the 1950s and are now virtually indispensable to airlines because they enable their revenue streams to be maximized by efficient inventory control (an inventory in this context refers to an airline's stock of passenger seats that is available for sale). The way all this hangs together is shown in Fig. 3.1.

The agent terminals, which are usually PCs nowadays, are connected on-line, usually via leased telephone data lines, to the central host computer system or CRS. The host computer is almost always a main-frame with a massive data base attached. The main-frame host polls each travel agent terminal every second or so, to see if it has any messages to send. At the agency end this polling is controlled either by a dedicated communications controller or by a master PC. If the agent's controller has messages to send, it sends them to the main-frame for processing. This may involve looking up a passenger's PNR, assembling a fare quote or sending an enquiry to another airline. Eventually a response is formulated by the main-frame and when the poll allows, this message is transmitted back to the agent's terminal where it is displayed on the screen. The whole process is repeated and forms what is known as a dialogue. In certain cases there are special messages that are intercepted by the agent's controller, such as those that control the printers in the agency. Such messages do not appear on the screen but instead cause the printer to spring into action and produce an airline ticket or an itinerary.

Well, that covers the way in which airline CRSs 'talk' to travel agents, but there is also the communications between the airlines themselves. This

communication comprises messages from one airline to another saying, for example, 'my flight number nnn is full' or 'I have sold a seat on flight number xxx', and so on. In other words there is a lot of message traffic between the airline's CRS computer systems. In fact, there is so much traffic that the airlines have clubbed together and set up two very large global communications networks to handle telecommunications on their behalf. In Europe, the SITA network handles inter airline message transmission whereas in the USA the AIRINC network is used. These networks were not originally designed to handle on-line traffic. Their method of operation was, and still is to a large extent, store and forward. In other words, a message is sent into the network where it is stored awaiting a spare communication channel down which to travel. So, the delivery time can vary between a few seconds and a few minutes (or even hours in certain cases!).

Now I used one or two terms in that preceding paragraph with which you may be unfamiliar. The terms that need a little more explanation are used liberally when any discussion of airline systems takes place. I think the buzz words and terminology are as bad as that used within the IT world. Anyway, the next section attempts to explain some of these terms in plain English.

- **The PNR** The PNR is perhaps one of the most critical pieces of information used to reference a passenger reservation in an airline CRS. The PNR may be used to reference a booking using an airline CRS terminal or via the telephone to a reservations operator of the airline concerned. An airline CRS holds one PNR for each passenger and for each trip. A busy business travel passenger, for example, could therefore have several PNRs in an airline CRS, one for each of the forthcoming trips being planned and organized by the travel agent.

  The code by which the PNR is referenced, is the primary key by which a booking is accessed. The code itself is simply a series of alpha and numeric characters. The PNR contains all the core data about the passenger and the associated booking record that is held on the CRS data base. In order to be able to retrieve a passenger's booking details you need to know the airline in which the reservation is held and the PNR reference. In a sophisticated CRS, a booking locator allows several PNRs relating to a passenger's trip to be referenced using just a single code. So in other words a booking locator is the master key to the PNRs stored in several airline CRSs, all of which relate to a single booking for a passenger or group of passengers.
- **Last seat availability** This is one of the most important features of an airline reservations system. Put simply, it is the ability of a CRS literally to sell the last seat available on a flight, immediately prior to the airline designating the flight as full. It may not seem such a big deal but consider the following situation in which you are a travel agent:
  - A business customer calls and requests a seat on a flight to a frequently visited city, say Paris, at the last moment. It really is an important meeting that he has to attend and he must catch the mid-day flight today.
  - You quickly access your high-tech CRS terminal and it shows the flight as full. You apologize but there is nothing more you can do.
  - However, the business traveller doesn't give up and he sneaks down to the travel agency around the corner just for one last try to get the mid-day flight to Paris.
  - This agency is using a different airline CRS and the traveller asks the same question about a flight to Paris today. The travel agent accesses the terminal and surprise, surprise: – 'Yes, a seat is available. Would you like me to book it for you sir?', asks the smiling travel agent.
  - Having booked his ticket, the traveller storms into his finance director's office in a rage and demands that he switch travel agent because the existing one doesn't know what is going on and can't get the flights the company needs.

A sorry tale but one that typifies how many a profitable business account has been lost to the competition. How could it possibly happen when both travel agents had the latest in CRS technology? The answer is to be found in the way an airline controls its seat reservations

and in the precise way in which it is connected into the CRS systems of other airlines.

When a flight is nearly full, the airline operating the flight will close it out when there are only, say five seats, remaining to be sold. Closing the flight out means telling all other airlines that the flight is now full and is not available for further seat sales. This is accomplished by sending a message through the SITA network to all other airline CRSs with whom a sales agreement exists. This message is known as an availability status (AVS) message. An AVS message may either say 'no seats left' or it may say 'only four seats left' and then send out other AVS messages as the last few bookings arrive.

The reason AVS messages are sent is so that the primary airline can offer its own customers or its close partners, those last few precious seats. In my example above the first travel agent had an airline CRS that accessed the desired airline system indirectly via a separate link, possibly using SITA. The second travel agent was, however, using an airline CRS provided by the airline who had just the last few remaining seats to Paris on the day in question. It had closed out the flight to other airlines and only showed those last few seats to terminals that were connected directly to its computer and data base.

There are several different ways in which the airlines participate in each other's CRSs in the area of seat bookings. These are known as levels of participation and give rise to some commonly used terms that are important to understand fully if you are to grasp the essential differences between one CRS and another. So, let's look at the various levels at which CRSs participate in each other's systems.

Levels of CRS participation

This is all about how the CRSs interact with each other. The level at which a CRS participates in another CRSs system is governed by the type of connection between them and the relative functionality of the computer systems involved. The reason that this topic is so important to a travel agent is that: (a) it governs the type of display the travel agent sees on the CRS screen, (b) it determines the level of reliability that may be placed by the travel agent on the booking status displayed by the CRS, (c) it governs whether last seat availability is provided by the CRS or not, and (d) it determines the timeliness with which the reservation is made. From the airline's viewpoint the level of participation also determines the booking fees that are payable when a seat is sold through a CRS for one of the participating airlines.

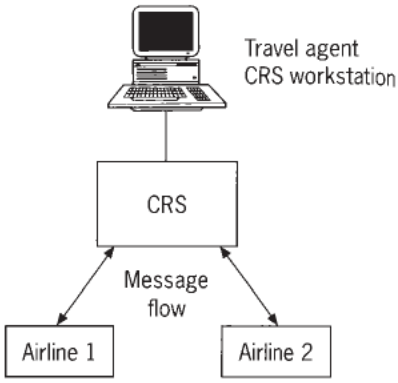


Figure 3.2 CRS Interconnection methods

The type of connection between the CRS and its participating airline systems (Fig. 3.2) is governed by several factors. The first of these is the message flow between the systems and the second is the relative speed of the telecommunications link between them. Let's look at these factors in a little more detail:

- **Message flow** This is the message flow between two interconnected CRSs. This message flow or dialogue may be one-way only or two-way. Most CRSs use a two-way message flow, whereby messages can flow from the participating airline to the CRS and from the CRS to the participating airline. These message flows can occur in one of two ways. They can be off-line or on-line.
- **Off-line** With an off-line connection between the participating airline and the CRS, message flows are separated by a substantial period of time. This may be anything from a few minutes to several hours. This delay is usually due to the passing of the messages over a store and forward communications network. The request is sent through the SITA or AIRINC networks jointly owned by the airlines.

- **On-line** An on-line connection between the participating airline and the CRS allows messages to be sent and received with only a few seconds or even fractions of a seconds delay. This is usually achieved by means of a dedicated high speed communications line connecting the two computers.

Although these factors are the principal ones that control the levels of participation, the relative sophistication of the CRS and the other airline systems involved also add dimensions of their own: and then there is the inevitable marketing involvement that is all about differentiating a CRS from its competitors. The result of all this is that there are a number of terms that describe the way bookings are made by CRSs. Some of these terms have become almost a standard throughout the industry while others have been modified slightly to form brand names offered by certain CRSs. The whole subject is therefore complex and difficult to understand without a lot of knowledge of the CRS technologies. It is for these reasons that there is a fair amount of confusion in this area. In order to try and overcome this, I have attempted to try and define the most commonly used terms that describe each level of CRS participation. Then when I come on to discuss specific CRSs and their big brothers, the GDSs, it should be easier for you to understand some of the proprietary brand labels given to their versions of participation levels.

- **Availability and phone** This is probably the most basic level of participation. It is based on a one-way off-line message flow. This enables the participating airline to send its flight schedules on a periodic basis to the host CRS. Travel agency users can view the airline's availability display as shown on the CRS screen but cannot book directly. To make a booking enquiry the agent must telephone the airline and talk to a reservation clerk.

  So, this level of participation is rather primitive and is labour intensive for the travel agent (and for the airline too). It is also inaccurate because the display shows the flights as though they are available whereas when the phone call is made, the flight may in fact be full.
- **On request** The message flow between the participating airline and the CRS is two-way, but is off-line. This allows the airline to send its flight schedules to the CRS on a periodic basis for display purposes. The travel agent can view the airline's availability display and can use the CRS to make a booking for selected seats. When the CRS receives a booking request such as this it will send a message to the airline saying: 'Can I sell this seat?' This message is sent via one of the airline networks, such as SITA, to the participating airline. Sometimes this stage of the booking process is known as 'sell and report'. At this stage the booking is held on the CRS, but is not confirmed. The booking is said to be 'on request' and the process itself is often referred to as 'hold and confirm'. A response is eventually received from the participating airline, which states whether the seat has been reserved or not. The CRS updates the PNR to show the status of the booking.

  This is better than the previous method but is still a long way short of being ideal. The travel agent must keep accessing the CRS to see if the booking has been confirmed or not. This is a labour intensive and non-productive task. During this stage the customer is in a state of limbo, not knowing whether or not a seat has been reserved on the flight.
- **Full availability** As with the previous method, the message flow between the participating airline and the CRS is two-way and off-line. This allows the airline to send its flight schedules to the CRS on a periodic basis for display purposes. The travel agent can view the airline's availability display as shown in the CRS system. The availability display shows the maximum number of seats that can be sold without reference to the participating airline. This maximum number of seats is usually four or seven. The travel agent can use the CRS to make a booking for selected seats, up to the maximum shown. At this point the travel agent can assume that the booking is confirmed and no further action is necessary. The CRS then formulates and sends a message to the participating airline saying: 'I have sold the following seats . . .' and this is used by the participating airline to update its seat inventory.

  When the flight begins to fill up, the participating airline will send a message to the

CRS reducing the maximum number of seats that are available for sale via the CRS, without direct reference to the participating airline. Eventually, the participating airline will send a 'no seats available' message to the CRS for the flight in question. In fact the participating airline will usually do this when there are only about four or five seats actually remaining. It holds on to these last few precious seats for its own special customers who book direct.

This form of access is sometimes also known as 'free sale', i.e. the seat is sold on the basis that no news is good news. In other words, the selling airline has permission to sell the operating airline's seats unless told not to do so. So, this form of participation does not provide the travel agent with true last seat availability; and there can be problems too. Sometimes because the message flow is off-line, the booking message from the CRS may get delayed or even lost! In these situations the participating airline may have sold all the seats on the flight before it receives the booking message from the host CRS. So, unfortunately, it is possible for a seat to be sold yet for there to be no room on the flight, again due to slow communications. In summary then, full availability is a method that is more open to potential problems and customer service issues, which often end up on the travel agent's plate.

- **Direct access** The message flow with direct access is two-way on-line. The participating airline sends its flight schedules to the CRS on a periodic basis, as before. Also, the availability display on the CRS will again show the maximum number of seats that may be booked without further reference to the participating airline. However, with direct access the travel agent can book as many seats as is required by the customer. When the travel agent makes a booking, the CRS enters into a computer-to-computer dialogue with the participating airline. The required number of seats are 'taken' straight out of the seat inventory of the participating airline system's computer. As the flight begins to fill up, the number of seats available will decline. However, even the last seat on the flight is available for sale via the CRS.

  This is a true last seat availability method and as such is superior to the other methods discussed so far. However, there are one or two problems that need to be guarded against. Some CRSs show the availability as at the time that the last message was received. So, the travel agent thinks that there are seats on the flight and proceeds with the reservation only to find that just prior to ending the transaction the CRS will respond to the effect that the flight is actually full. This can cause a bit of confusion between the travel agent and the customer. But all in all, direct access is a vastly superior method of participation than many others because the airline is in touch with the booking situation in real-time and can feel more confident that it has the true booking status of its flights.
- **Multi-access** This level of participation uses a two-way message flow and is on-line. Multi-access is, however, quite different from the other methods of participation discussed so far. It is the provision of reservation functions to multiple participating airline systems. In order to accomplish this multiple link-up, an on-line real-time communications link is required between the CRS and the participating airlines. On the face of it a multi-access airline system is good news for the travel agent because it provides direct access to a wide selection of airlines with last seat availability on each one. The availability displays show the actual number of seats remaining for sale, i.e. true last seat availability. Invariably, a CRS with multi-access will use a common language for all the inbound messages keyed by the travel agent. Outbound screen formats are, however, not converted and usually appear exactly as they were formatted by the host system (see below for a description of the term common language).

  In order to use the participating airline's system the travel agent enters the two-letter code of the airline that needs to be accessed. The CRS then effectively connects the travel agent directly to the computer of the airline to be accessed. Once connected, the travel agent carries on a dialogue with the selected airline's computer system until a booking is made or

the customer's enquiry is answered. Each airline available via multi-access is sometimes said to operate in a partition of the CRS. A partition is really a sub-division of the CRS's computer, which is dedicated to communication sessions with a particular airline system. Multi-access CRSs are therefore largely unbiased because the user is free to choose the CRS to which a connection is to be made.

But in the past there was often a price to pay for this multi-access; and the price was the need to keep a manual record of the booking locators or PNRs for your clients. You see, once a reservation was made in a particular airline's computer, the agent needed to know how to find that booking record again should the customer wish to modify the booking or should the agent wish to retrieve the record for ticketing. The agent will suffer a degree of embarrassment if the only response is: 'Well, I know your booking is in there somewhere!' Unfortunately, some of the earlier multi-access CRSs did not keep a log of which airlines the bookings were stored in.

Nowadays, however, most of the more sophisticated CRSs have a feature known as PNR indexing that aims to overcome this problem. The way PNR indexing works is by building a special program into the CRS computer itself. This program maintains a file of all PNRs created and indexes them by a variety of key fields. Put simply this means that the CRS builds a sort of index card that contains the passenger's name, the travel agent who made the booking and the airline in whose system the PNR is stored.

- **Answer back** This is based on a two-way message flow with on-line communications. The participating airline sends the CRS its flight schedules on a periodic basis. The travel agent can view availability and this will show a maximum number of seats bookable. However, the travel agent can book as many seats as are needed by the customer. As with direct access, the CRS then enters into a computer-to-computer dialogue with the participating airline and 'takes' the number of seats required directly out of the inventory (assuming the seats are available). The participating airline responds by sending a message back to the CRS; this is known as an 'answer back'. The CRS updates the PNR with the answer back code received from the participating airline.

  Besides providing last seat availability, this level of participation provides a comfort factor to both the travel agent and the customer. In the event of any dispute about whether or not the seat was actually booked and confirmed, the booking record, i.e. PNR, can be retrieved and the response code received from the participating airline can be used as evidence of confirmation.
- **Direct connect** The message flow is two-way and on-line. Once again, the participating airline sends its flight schedules to the CRS on a periodic basis. The travel agent can view availability and this will show a maximum number of seats bookable. However, the travel agent can book as many seats as are needed by the customer. As with direct access, the CRS then enters into a computer-to-computer dialogue with the participating airline and 'takes' the number of seats required directly out of their inventory (again, assuming the seats are available). However, in this case, the participating airline responds by sending its own PNR locator code back to the CRS. The CRS updates the PNR with the locator code received from the participating airline.

  Again, this provides true last seat availability. It also goes one step further than answer back, however, and is a true customer service advantage. Having the airline's PNR locator is a lot more reassuring for the customer and eliminates delays while travelling. Delays that may otherwise be experienced when passengers need to approach the participating airline directly to resolve a query or confirm a flight. In cases like this the participating airline can clearly see their own locator and use this to find the booking in their own system without delay to the passenger. Direct connect is also a boon in cases where there is a ticket on departure (TOD) to be collected at the airport by the customer. It simply requires the travel agent to send a copy of the booking to the airline desk for the PNR to be retrieved and ticketed without delay.

- **Direct connect availability** This is sometimes known as 'seamless availability'. It is based on an on-line two-way message flow between the CRS and the participating airline. With this level of participation, when a travel agent requests an availability display using the CRS terminal, the CRS accesses the participating airline's seat inventory directly. This allows the CRS to build a picture of the actual number of seats available for sale at that point in time. The CRS then proceeds to build an availability display for the travel agent that shows the actual number of seats available. The travel agent can then book any number of seats, up to the number shown as being available.

  When a booking is made the CRS then enters into a computer-to-computer dialogue with the participating airline and 'takes' the number of seats required directly out of the airline's inventory (assuming the seats are available). As with direct connect, the participating airline responds by sending its own PNR locator code back to the CRS. The CRS updates the PNR with the locator code received from the participating airline.

  This is the ultimate in CRS inter-operability. It allows the travel agent to enjoy the benefits of multi-access, e.g. actual availability displays, with the advantages of working within a single CRS environment, e.g. common language and central PNR referencing. The only problem is that the number of airlines with CRSs capable of supporting this level of functionality are somewhat small at the present time.

So, returning to my little case story above, the first travel agent did not have last seat availability access to the airline's seat inventory and was closed out before the last few seats were actually sold. Whereas the second travel agent around the corner was directly connected to that airline's system and therefore enjoyed the benefits of full last seat availability.

Common language and by-pass

Although the airline systems are very similar in many ways, they are nevertheless different enough to prevent a travel agent trained in one system from being able to simply use another airline's CRS without a fair amount of re-training. One of the main reasons for this is the difference in entries that need to be made at the keyboard in order to get the CRS to perform the required function. Compare, for example, the entries for an availability display in British Airways' BABS and American Airlines' Sabre systems for flights between London and New York on 30 June (Table 3.2).

Table 3.2 CRS native language examples

CRS	*Availability request entry*
British Airways	A30JUNLONNYC
American Airlines	130JUNLONNYC

As you can see, the entries are similar but different in some basic respects. A common language is a set of frequently used commands, which have been standardized for a number of airline systems; like a sort of Esperanto of CRS languages. Common languages were developed mainly by the providers of multi-access systems. This made usage of the CRS simpler for users because they needed to remember fewer command codes in order to use a variety of airline CRSs. However, it would have been too complex a task to develop a common language entry for all commands in all airline systems and so the common language was restricted to only the essential and frequently used commands. This was quite acceptable because it was often useful to have access to the native commands of a particular airline's system. This kind of access to an airline's native commands was called 'by-pass'.

So, for example, in the world of multi-access, an agent first selects an airline CRS and requests connection to it. Then the common language is used to interrogate the airline's system to determine if its inventory can satisfy the customer's requirements. Finally, by-pass entries are used to access those functions that are provided by that airline only. Quite a wide range of capabilities; but a challenging training task, because the agent must learn the common language as well as the individual commands supported by all the other airlines. Another factor to consider here is that the host CRS system must perform a somewhat

complex translation into the reservations language of the other airline CRSs being used. This can sometimes slow down the response times marginally and also restrict the set of functions available using the common language.

Pseudo city code

The pseudo city code is an important code that is assigned by a CRS to each user terminal when it is first set up (or initialized). This is the three character city code that is used to denote the location of the user. It is used by a CRS for many purposes including, for example, in constructing an availability display for a user. When a travel agent, in say, Sheffield requests an availability display for flights to New York using a CRS, the system first of all looks at the agent's pseudo city code. It then works out the country and uses this to select the departure airports for the itinerary. So, in this example the CRS might show Manchester, from which there are in fact direct flights to New York, or it might show London Heathrow or Gatwick. Other airports would be lower down the list. The sequence of the flights shown depends to a large extent upon the departure time specified. However, it would not show flights departing from, say, Paris. These departure airports are all worked out from the pseudo city code that is logged in the CRS core system for each user's terminal. It is often possible for the travel agent to use an atlas function in the CRS to find the nearest airport to the travel agent's city, if this was not known.

The pseudo city code also enables the CRS to determine default flight departure times. If for instance a departure time is not specified when making an availability enquiry, the CRS will have to make some assumptions on the departure times of flights that are to be shown on the display. For example, the default departure time for a UK traveller might be 1 p.m. The travel agent can, however, often alter these default departure times to suit the travel agent's own needs.

Finally, the pseudo city code allows different rates to be displayed for hotel and car companies that participate in a CRS. There are, for example, different sets of rental rates applied by many car rental companies, depending upon the country in which the customer is going to rent the vehicle. The rate for an economy car rented in the USA for instance would be one price whereas in Europe it would be another: if the pseudo city is used in conjunction with the terminal address, then different rates can be displayed for different travel agency users. It is thus possible for a multiple travel agency to have all of its negotiated corporate hotel rates shown on any of its branch CRS terminals whenever a hotel rate is accessed.

Shared travel agent access

Travel agents who are part of a multiple chain whether it be large or small, UK domestic or internationally spread, can have access to a common pool of client booking information. This must of course be agreed at the head office level and all branches must be in agreement on the principal of sharing data. The CRS can then alter its access security control system to allow travel agent A to access the bookings created by travel agent B. This can be a powerful servicing tool if used properly. It means that the customer can make a reservation in any travel agency in the group and be assured that the booking can be retrieved by another agent within the group. This is especially powerful if the traveller can be serviced while on a trip and in another country.

FARES AND FARE DISTRIBUTION

According to IATA, distribution costs form the greatest slice of airline expenditure. They amount to US $20 billion annually. Hence it is no surprise that airlines place great emphasis on getting information about their fares and schedules to the marketplace quickly and efficiently. While all airlines ultimately would wish to get their information right in front of the passenger and to take the booking directly from him or her, it is still true that the CRS and/or GDS account for most airline bookings today. Any services that efficiently supply data to these systems will be taken extremely seriously by airlines. Although this is principally an activity of prime interest to airlines and GDSs, it is nevertheless important for anyone in the field of travel and tourism to understand how this process is controlled if some of the characteristics of GDSs are to be understood fully. Take

for instance the services offered to airlines by Reed Travel Group under the OAG brand name.

Two key services provided by Reed Travel Group help airlines control the distribution of their flight schedules and fares information to global CRSs and GDSs. These are known, respectively, as OAG Direct and OAG Genesis. In a deregulated environment, which has made fares extremely volatile as airlines vie with each other for passengers, a service such as Genesis is critical to an airline as it can help increase its market share by ensuring that the market is informed swiftly of new fare deals intended to beat the competition; and, it can help to reduce an airline's administration costs. Fares must be distributed accurately, widely and quickly to the world's population of GDS terminal users. Schedules, also, are changing more quickly as airlines focus increasingly on the market-competitiveness of flight timings and services, rather than on the operational aspects of schedules. It is key that an airline's schedules need to be updated in all of the world's GDSs as soon as is practically possible. Let's take each of these two services in a little more detail:

- **OAG Direct** Reed Travel Group is the leading distributor of airline schedules in the world, supplying all the major airline CRSs and all major GDSs with data. Reed operates one of the largest airline schedules data bases in the world, holding the schedules of more than 800 airlines and processing hundreds of thousands of schedule changes every month. A schedule only has to change by one minute to make a change happen on Reed's data base. Currently, more than 80 per cent of the data held is received from airlines by automated means, usually in the industry standard format (co-ordinated by IATA) called the (standard schedules information manual (SSIM). This standard format helps the industry to communicate schedule changes in a more co-ordinated way. Reed's twin roles in this area, i.e. in helping IATA set data standards and as a data intermediary between the airlines and the GDS, cannot be underestimated. It plays a major part in keeping the industry together.

  The current method of getting schedules data to GDSs has been used for many years and has been recognized as a reliable way of distributing schedules information to the marketplace. With increasing competition and schedules volatility, the length of time it takes for the information to get onto GDS screens (this can take up to two weeks), has provoked demands from airlines for the process to be accelerated dramatically. The cost to the industry of poor schedules synchronization between the various GDSs and airlines' own CRSs has been estimated at US $1 billion annually – an amount that airlines would be eager to slice off the US $20 billion they spend each year on distribution.

  Reed Travel Group's response to market demands for a swifter schedules distribution service is OAG Direct. This service enables schedules on the Reed database to be updated in an instant by airlines, and for those changes to be transmitted almost immediately to the GDSs. It uses a development of the SSIM standard format to communicate only the changes made to the data base. The key to this process is Reed's ability to process fully the necessary standard schedules messages (SSM) and *ad-hoc* schedule messages (ASM). However, airlines supplying data to Reed and not having the capability themselves to generate these standard messages can still use OAG Direct. Reed has developed the capability to transform schedules supplied in any format whatsoever into SSM and ASM for swift supply to the GDS.

  The benefits of the service are considerable. They arise principally because airlines can be sure that the schedules appearing on GDS screens are synchronized with their own reservations systems. This means they will not have to re-book passengers whose bookings were made using old schedules still displayed by the GDSs. Re-booking means inconvenience to the passenger and extra booking fee payments that airlines must make to GDSs. For the GDSs, up-to-date data are vital in their drive to compete in the cut-throat battle to gain market share. OAG Direct guarantees them up-to-date and accurate data.
- **OAG Genesis** The Genesis product (Fig. 3.3) provides a fares distribution service to the world's CRSs and GDSs, on behalf of airline

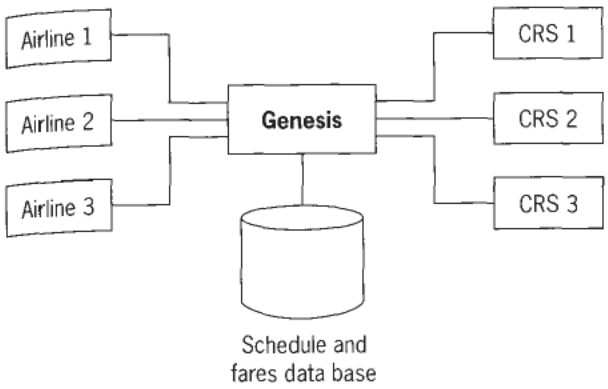


Figure 3.3 The Genesis system

customers. It is vital that GDSs and CRSs have access to the latest fares information, as they will fail to maintain market share if the fares offered by them prove to be incorrect. Reed Travel Group has become a leading player in the airline fares distribution business, providing the following GDSs with fares information:

- Amadeus.
- Galileo.
- Sabre.
- System One.
- Worldspan.

The data base that is used to record all this information is massive. It contains nearly one million individual fares and 5,000 fare rules; and it works pretty efficiently, because it handles hundreds of thousands of changes to the data base every month. The information is widely used because the combined population of travel agency users totals almost 500,000 GDS terminals world-wide, each of which obtains a proportion of its fares data via Genesis. These terminals generate more than 70 per cent of the world's airline seat sales.

Fares filing

Besides distributing fares to global CRSs and GDSs, the OAG Genesis service is also concerned with helping airlines to file the latest fares with the appropriate authorities at both ends of a route, using the automated tariff filing (ATF) facility. Each time an airline adds a new fare or changes an existing one on a route, it must report the details to each of the appropriate airline regulatory authorities in the countries affected. In the case of the UK, for example, if a flight starts or ends in the UK then its fare details must be reported to the CAA and several other similar government organizations in other countries.

Because the number of fares is enormous and the rate of change very high, this is a difficult and costly task for the airlines to handle themselves. In fact, with the EC's 'open skies' policy, it is going to be difficult increasingly for an airline to remain competitive without using some form of electronic fares filing service. Reed can help by providing an administrative infrastructure that can be used by airlines to remove a non-productive task and allow them to concentrate on sales and marketing activities. Genesis' automated tariff filing works like this:

1. The airline loads the fares information onto a PC using Genesis' airline tariff automated collection (ATAC) software. This is a flexible PC software package that allows fares information to be transmitted direct from a carrier to the Genesis data base in a recognized standard industry format. This information also can be transmitted direct from the airline system on a host-to-host link. Alternatively, information can be supplied manually.
2. If the fare is approved already, it will be loaded directly onto the data base for distribution.
3. If the fare is not yet approved, Genesis fares distribution, through its ATF facility, can process the filing application electronically with the relevant authorities.
4. Once stored within the system, fares are transmitted rapidly and in many cases daily to every one of the world's major CRSs and GDSs.
5. These CRSs and GDSs then provide access to the fares data via reservation terminals that are located in sales and servicing outlets around the world.

There are, in fact, two other companies – apart from Reed – that undertake this business: SITA FAIRSHARE and Airline Tariff Publishing Company (ATPCO). Because these are non-profit making companies owned by the airlines, Reed faces a tough challenge in competing for business. However, Reed's strong position, which arises from its highly developed data expertise, has provided it

with a springboard from which to launch several other related products, e.g. see EasyRes in Chapter 6.

Management information

Reed can also provide valuable management information that is generated from its data bases. Given the size and comprehensiveness of Reed Travel Group's fares and schedules data bases, their suitability for providing insight into trends in the industry is obvious. Reed offers a specialist service called 'market analysis', which allows customers such as airlines, airports, aerospace companies and consultants to request specially tailored information relating specifically to their areas of interest. Market analysis is a really valuable service, for example, to airlines in today's business environment as it allows them to track competitors' activities and adjust their own strategies accordingly.

SITA's AIRFARE service

But Reed is not the only company to provide fares distribution and support systems to the airline market. SITA operate several services in this area as well. SITA is part of a group that operates the world's largest data communications network, servicing customers in 225 countries. The SITA AIRFARE product offers airlines and GDSs the capability to improve their service to customers greatly by providing access to systems providing automated quotations of passenger fares. This includes a function that supports the detailed itinerary pricing of all domestic and international journeys of up to 16 segments. The PRICECHECK product provides airline tariff departments with limited access to AIRFARE for the purpose of monitoring their own airline fare levels and rule interpretations in AIRFARE.

A related set of products branded 'fares data supply' also is provided by SITA. These products are derived from the AIRFARE system and are available to airlines, GDSs and tariff publishers for a variety of uses: (i) GDSs utilize SITA fares data to support the functionality of their in-house fare quotation systems; (ii) airlines use the system for decision support, revenue accounting and internal paper tariff publication; and (iii) publishers use SITA fares data for their book production (in fact all major paper tariff publications use this system). Airlines may distribute their fares to GDSs world-wide free of charge via AIRFARE. SITA fares distribution provides airlines the unique capability to control their own fare updates via a PC connected directly to the AIRFARE data base through the SITA network.

TICKETING

The automatic printing of airline tickets is an important productivity aid to any travel agent with a high volume of business travel. It is important to understand the different types of ticket stock before we start looking at the different technologies used to produce them. To be able to issue airline tickets at all, the travel agent must possess an IATA licence. This licence stipulates the specific airlines that may be ticketed by the agency. With manually issued tickets, the agent is provided with a metal plate that is used to emboss the airline ticket, rather like a manually issued credit card voucher. The use of the *plate* terminology is carried over to automatically issued tickets as well. CRSs will only allow travel agents to issue automated tickets for those airlines for which it holds a *plate* issued by IATA.

At present, besides manual airline tickets, there are two types of tickets that can be printed by a computer system: off-premises transitional automated tickets (OPTATs) and ATB tickets. Each is explained in more detail below.

The OPTAT ticket

The OPTAT ticket (Fig. 3.4) has been in use now for at least the past five or six years. It is issued by BSP UK on behalf of IATA and is on continuous paper stock for use in computer impact printers. The stationery itself has several copies, each of which serves a different purpose. The image is carried from the top copy, by impact, onto the copies underneath. This is accomplished by means of the characteristic red 'carbon' that is coated on the reverse of all copies. The stationery is designed so that once printed and torn off the printer, it can be folded in two so that an IATA emblazoned logo (red on blue) appears as a kind of ticket cover. Travel agents invariably staple the

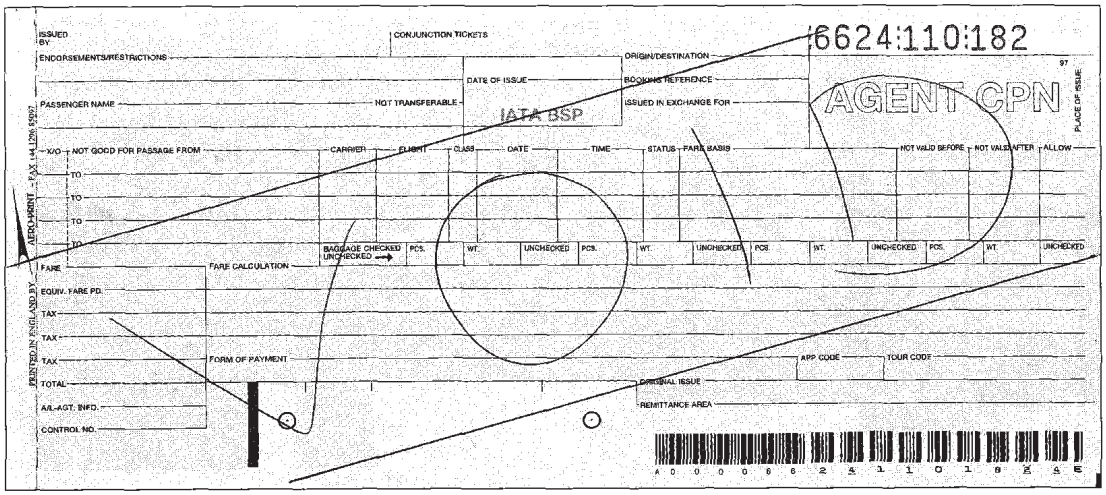


Figure 3.4 The OPTAT ticket

ticket into one of their own personalized ticket wallets. The stationery is formed in pairs of documents, the first being the ticket itself and the second being a credit card charge form voucher. The copies of the ticket are used as follows:

- **Airline ticket**
  1. Audit coupon (sent to BSP as part of settlement process).
  2. Travel agent coupon (filed in the office client file).
  3. Passenger flight coupon 1 (given to the passenger).
  4. Passenger flight coupon 2 (given to the passenger).
  5. Passenger flight coupon 3 (given to the passenger).
  6. Passenger flight coupon 4 (given to the passenger).
  7. Passenger copy coupon (given to the passenger).
- **Credit card charge form**
  1. Credit card company's copy.
  2. Travel agent's copy.
  3. Customer's copy.
  4. File copy.
  5. File copy.
  6. File copy.
  7. File copy.

The top copy of the OPTAT ticket used to be used for BSP settlement purposes (BSP is explained more fully in Chapter 7 – Agency management systems). In summary, it was Copy 1 of the OPTAT ticket that was used as the basis for the travel agent to pay the airlines, via an IATA clearing system called the BSP. Preparing these copies of the tickets issued is a laborious administrative chore but one that is crucial because prompt and accurate settlement of air ticket sales is a prime condition for retaining the travel agent's IATA licence; and without that licence, the agent cannot issue airline tickets.

ATB and ATB2 tickets

The use of ATBs is now widespread but has not yet fully replaced the OPTAT ticket. The ATB offers both airlines and travel agents some important productivity advantages and makes travelling easier for the customer as well. The ATB stock (Figs 3.5 and 3.6) is completely different in concept and appearance to the OPTAT ticket. The ATB is constructed from card and comprises only a single copy. It embodies a magnetic strip on the reverse side that is capable of recording data. Once data are recorded on the magnetic strip the data may be 'read' by special purpose reading machinery, which most major airlines are now installing at their airport check-in gates. The way in which the ATB is designed to work is generally as follows:

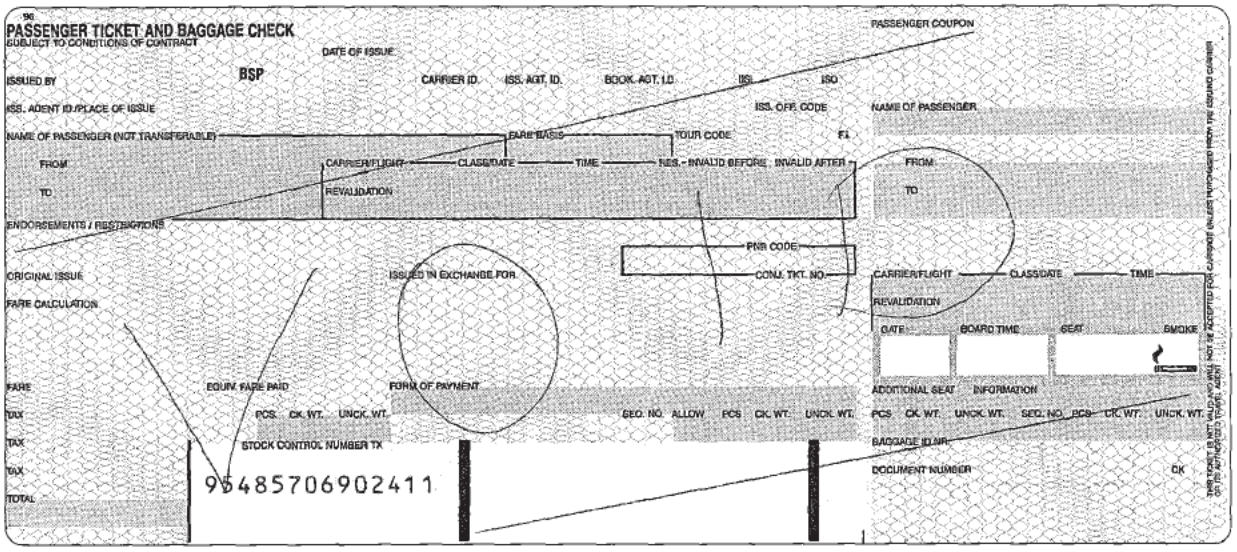


Figure 3.5 The ATB ticket

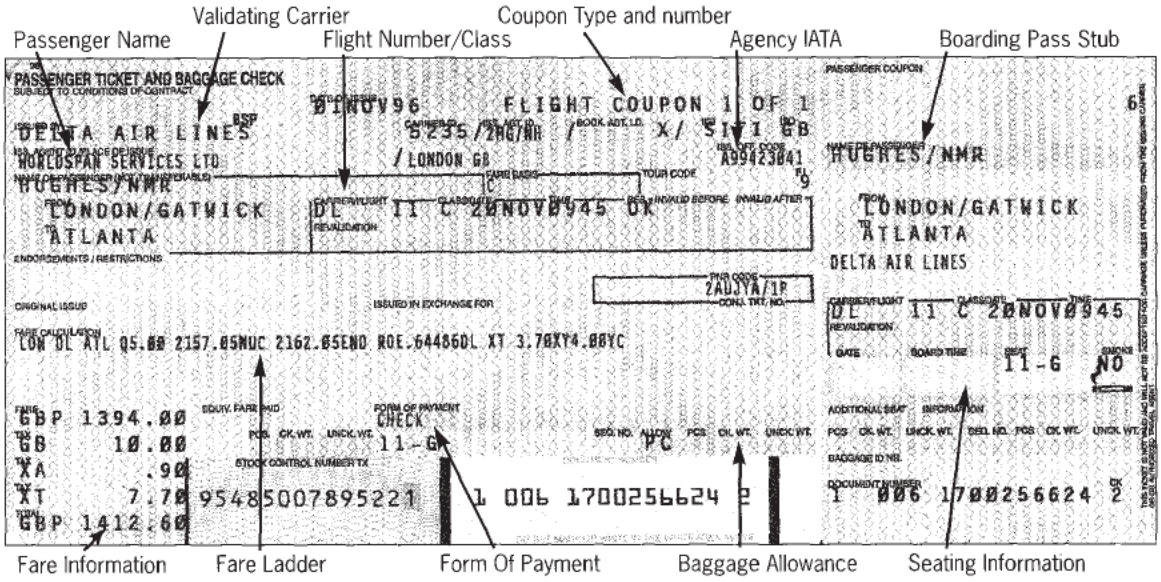


Figure 3.6 The ATB2 ticket

1. The ticket is printed by the travel agent using a special purpose printer. Besides actually printing the ticket, this printer also magnetically encodes the brown metal oxide strip on the ATB ticket stock with the details of the airline ticket purchased by the customer.
2. At the same time the printer also prints the other copies as required by the travel agent for the travel agent's files and the customer for supporting expense claims.
3. The traveller takes the ATB and presents it to the check-in gate. The check-in clerk inserts the ATB into a special reader that verifies that the passenger is destined for the correct flight, a reservation exists for the passenger, a seat is allocated and that the other ticket details are in order. The reader can also add data to the magnetic strip on the ATB denoting the check-in details.
4. When the passenger boards the flight, the ATB is presented to the flight welcoming steward

at the gate who inserts the ATB into another special reader that retains one part for the airline's revenue accounting purposes and returns the other portion to the passenger as the passenger's boarding card.

5. Meanwhile, the airline in whose system the reservation was made and that produced the passenger's ATB, reports the ticket details direct to BSP, electronically. This saves the agent from having to batch and submit physical ticket stubs manually.

The advantages to the airline of the ATB over the OPTAT ticket are fairly obvious. They allow the airline to mechanize its flight departure operations to a far greater extent than ever before. But there are important advantages to the travel agent as well. Avoiding the BSP batching and reporting task is perhaps the greatest advantage. Then there is the satellite ticketing advantages as described in the following section, as well. Finally, the customer even benefits because using an ATB will mean a faster transit through the airport and onto the flight.

Electronic ticketing

Electronic ticketing, or e-ticketing as it is commonly referred to, eliminates the need for paper tickets. Instead of a ticket being printed and the various copies processed by the agent, the passenger, the airline and BSP, an electronic image of the ticket is used to control flight boarding, settlement and revenue accounting. E-ticketing is possibly one of the most significant developments within the field of travel automation. Not simply because it makes life easier for the airlines but because it has far reaching implications for new electronic distribution systems like those based on the Internet. So, before we can explore these implications and consider the new systems that are beginning to surface, it is important that you grasp some of the fundamentals of e-ticketing.

E-ticketing has been in widespread use in the USA for some time. However, in Europe, it is in the early stages of roll-out. Scandinavian Airlines System (SAS) and Lufthansa were two of the first European airlines to introduce e-ticketing; and in the UK, ticketless travel is supported by British Airways and British Midland. It is important to realize that e-ticketing is a CRS supported function that can be used to book: (a) airline seats sold directly to customers by the carriers themselves, and (b) airline seats sold to customers via travel agents. Travel agents obtain e-ticketing functions via their GDSs, which are of course connected to the airline's CRS. So, for e-ticketing to be possible from a technical standpoint the airline's CRS and the travel agent's GDS must both support e-ticketing functions. Take, for example, the domestic air travel business of British Airways in its home market – the UK.

British Airways e-ticketing

British Airways piloted its e-ticketing system on the Gatwick to Aberdeen route for a period of six months. The pilot trial was judged to be very successful and as a result, BA together with most of its franchised carriers, introduced e-ticketing on all UK domestic routes on 12 March 1997. By early 1997 BA was carrying around 3,000 ticketless travellers per day. Also during this year certain travel agents could use Galileo or BA Link (British Airways' own viewdata system), to interactively book e-tickets. Agents using other GDSs could issue BA e-tickets, but only by queuing them to the BA system, just like a ticket on departure. However, all GDSs have plans to add e-ticket functionality within the UK very soon.

British Airways e-ticketing via Galileo travel agents

Travel agents in the UK can use the Galileo GDS to issue e-tickets on British Airways domestic routes. The principal way that this is accomplished is via the various Galileo PC workstation products. The following section therefore explores in more detail, how BA e-tickets are issued by travel agents using the Galileo GDS. Before we begin, there are certain conditions that must exist before an e-ticket can be issued:

- **E-ticket requirements** The standard ticketing process commences when three basic conditions have been met: (i) a reservation has been made for an airline seat, usually via a GDS; (ii) payment for the ticket has been received

by a travel agent or other intermediary; and (iii) the departure time is imminent. For e-ticketing to take place, however, there are a couple of additional conditions. First of all, the ticketing carrier must support e-ticketing on the customer's route, as booked. This is usually denoted by an 'E' on a GDS availability display. Second, the customer must have some form of plastic card that will enable them to use the self-service check-in machines at the airport (more on this later). For British Airways this may be either an Executive Club membership card or an E-ticket Access card. However, not all customers of the travel agency will necessarily possess an Executive Club card. In such cases the travel agent simply issues an E-ticket Access card from a stock supplied by British Airways (supplies of E-ticket Access cards may be obtained by the travel agent by telephoning a special British Airways hot-line). This enables an E-ticket Access card to be issued to a customer prior to commencement of their journey. Finally, it is necessary for the customer's card number to be present within their booked PNR.

- **E-ticket issue** Once these conditions have been met, the travel agent makes a simple entry on the GDS terminal that initiates the issuance of an e-ticket (incidentally, if the travel agent does not use a GDS, the agent can still request the booking source – usually the agent's airline reservations office – to e-ticket on the agent's behalf). Instead of a physical ticket being printed within the travel agency, an electronic image of the ticket is created within the ticketing carrier's system. This is really no more than a data record containing all the items shown on a physical paper ticket, plus a few extra fields. The e-ticket image will even contain a ticket number, just like a standard paper ticket. This ticket number, which is prefixed with the airline's unique three digit code, is used for accounting and reporting purposes in the usual way (see BSP in Chapter 7).
- **Other documentation** The only remaining piece of paper that must still be handed to the customer is that stating the terms and conditions of carriage, otherwise known as an airline passenger notice (APN). These terms and conditions were originally agreed by all the airlines at a convention held in Warsaw many years ago. They must be given to the customer by the agent prior to departure. This is not normally a problem because there are usually several other items of paper also given to the customer at this time. For example, the itinerary, luggage tags, hotel vouchers and information leaflets provided by the travel agent. At least one of the information leaflets given to the customer will explain how they should check-in when they arrive at the airport.
- **Self-service check-in** Checking-in with e-ticket is quicker and easier for passengers when they arrive at the airport terminal, than with conventional paper tickets. The whole process takes only a few minutes and is controlled by self-service machines that resemble ATM cash dispensers but which use efficient touch screen technology. These machines are usually located near to both the drop-off zone and the terminal concourse, often within their own area designated as a self-service check-in lobby. They accept passengers holding either an ATB or an e-ticket. (For an ATB ticket holder, the customer inserts a cardboard ticket – the machine then prints a few additional fields and electronically converts the ATB into a boarding pass.)

  E-ticket holders first insert their E-ticket Access card or Executive Club card into the self-service check-in machine. The traveller's card is validated by the British Airways system controlling the self-service machine. The system will check the number on the card against the number that has previously been entered into the PNR by the travel agent at the time of booking. Should a traveller have more than one e-ticket for travel on the day of check-in, the self-service machine will show a list from which the traveller selects the appropriate one. The flight details are then displayed along with the seat number originally allocated as part of the booking process. The traveller then has several options: either

  1. Retrieve the card and a boarding pass, which is automatically printed by the machine. The passenger may then proceed straight to the departure gate and board the flight.

2. Change the pre-allocated seat, i.e. the one originally assigned to them by the travel agent. This is done by viewing a seat plan and choosing another available seat on the aircraft.
3. Choose to receive a boarding pass for both the outward and return journey, provided the passenger is returning within 24 hours of departure.
4. Print another copy of the e-ticket itinerary and retrieve this from the machine along with the boarding pass.

- **Departure** Having done this, the traveller proceeds to the departure gate, boards the flight and departs. This can be a very speedy process for passengers with just carry-on luggage. However, if the passenger has baggage that needs to be carried in the aircraft's hold, then the passenger must still queue up at the manual check-in counter, hand over the baggage and collect a baggage check.
- **Settlement and accounting** In terms of the settlement process, e-ticketing allows settlement to be effected by current BSP processes. These systems had to be modified slightly in order to support e-ticketing, although this work has now been completed as far as the UK's BSP is concerned. For example, the most obvious modification was that the ticket image passed by GDSs into the BSP systems had to possess a special indicator designating it as an electronic ticket for which there was no paper equivalent. A similar identification had also to be present for refunds. In fact, many GDSs have already built automated e-ticketing refund processing into their back-end systems. Otherwise, e-ticketing from a sales reporting and settlement perspective is fairly straightforward. The processes involved are not significantly different from those used for paper tickets (see Chapter 7 for a description of BSP).

Finally, let's briefly consider the situation where BA customers book their flights directly, for example, via a BA telephone sales unit. These customers have not had any contact with a travel agent. However, they can still use the self-service devices at the departure airport to: (a) collect their travel documents as described above, and (b) pay for their tickets using their plastic cards.

E-ticket benefits and the future

E-ticketing offers many potential benefits to travellers, travel agents and the airlines. It cuts down on paper processing, eliminates the 'I've lost my ticket' problem, allows last minute changes, i.e. right up to 30 minutes prior to check-in, eliminates the need for TODs, simplifies the refund process and even has indirect benefit to airports in terms of easing congestion at check-in desks. Looking to the future, e-ticketing holds the promise of delivering vast improvements in the quality and level of management information available to airline customers. However, e-ticketing does require a fair investment of resources of airlines. For a start there is the construction and operation of the self-service check-in machines and lobbies. But more importantly perhaps, there is the investment needed to enhance the airline and GDS systems to support e-ticketing.

While this may not be quite so challenging for an airline's domestic routes, a whole new dimension of complexity is introduced when international routes are considered for e-ticketing. The reason for this is the existence of inter-lining agreements that airlines have negotiated with each other. What happens, for example, when a passenger on an overseas journey 'holding' an e-ticket wishes to change their flight for another airline that does not support e-ticketing? The administrative complexities and opportunities for endless bureaucracy are substantial. So, e-ticketing will no doubt come to pass, certainly for many domestic routes and even for flights within the EC. However, its widespread use around the globe may have to wait a few years. This is why for the moment, e-ticketing is only possible in the UK for BA customers with less than four sectors, none of which may be international flights or flights involving other carriers. Some of the other major issues that e-ticketing faces are as follows:

- **Commission levels** Many airlines claim, quite justifiably, that e-ticketing reduces the amount of work that a travel agent needs to do, e.g. print the ticket and process the ensuing settlement. It has been estimated, for example, that issuing an e-ticket takes an agent 20 per cent less time, compared with issuing a conventional ticket. Airlines are therefore cutting, or at least

discussing the possibility of cutting, agents' commission levels, e.g. SAS and Lufthansa have already reduced the commission on domestic e-tickets to 5 per cent.

- **Direct sales** Some travel agents suspect airlines of trying to use self-service ATM ticketing machines to build a customer prospect data base and then to use this to solicit these customers for new business. Although most airlines deny this, it is no doubt an issue that will only be resolved over the long term as new distribution channels evolve (see Chapter 5 for a discussion of disintermediation).
- **Legal issues** Will the terms and conditions of flight, as agreed at the Warsaw convention be communicated to passengers effectively? Because this will only be a separate piece of paper and not an integral part of the ticket as is currently the case, will travel agents always remember to give this to their customers and will passengers pay any attention to it?
- **Customer acceptance** Some customers will always feel more secure with a piece of paper and may in fact demand that their travel agent produces one for them.
- **Airport security** There remain many airports around the world where people are not allowed to pass into the 'air side' of the terminal unless they hold a valid ticket. The location of the self-service check-in lobby is therefore a critical issue for airlines. In most cases they will therefore need to be installed on the concourse before airport security.
- **Interlining** This refers to the flexibility currently enjoyed by passengers using airlines that have an Interline agreement. Such agreements allow a passenger to travel on another airline instead of the one shown on the ticket. The problem is that in order for this to be effected, the validating airline needs a copy of the ticket in order to prove that the passenger has the right to travel on their airline.
- **Shared check-in machines** At present each airline that supports e-ticketing in a country needs to install their own self-service device within the airline terminal. In the UK, British Airways has already done this and British Midland is thought to be planning to install similar equipment. How long will it be before airlines start sharing each other's self-service machines? This would make a lot of sense from a cost angle and from a logistics angle, i.e. in other words it could save a plethora of different and incompatible self-service devices from being installed in UK airports.

It is estimated that 20 airlines that participate in the UK's BSP will move to e-ticketing over the next seven to ten years. These airlines have the required level of in-house technology to make e-ticketing a practical reality; and because these airlines tend to be the larger ones, it is not surprising that they represent about 60 per cent of the UK BSP's ticket volume. Looking this far ahead, it is also possible to forecast e-ticketing for non-air carriers. However, despite these glimpses of a paper-less future, it is highly likely that travel agents will always need to keep a stock of hard-copy airline tickets for certain situations.

Satellite ticket printing

A type of printing of tickets, invoices and itineraries that is frequently used to service large business travel customers is known as satellite ticket printing (STP). It allows a small inplant location to produce airline travel documents without the need for travel agent workstations.

STP works like this. First, the central travel agency must have a fully functional reservations terminal and a data line connected by a communications controller to the remote inplant location. Then the inplant must have at least one printer that is connected via its own communications controller to the central travel agency site. It is usually best for the inplant to have three printers: one for airline tickets, one for itineraries and a third for hard copy. It is then possible for reservations made by the central travel agency location to be channelled to the inplant for document production, Because the inplant is usually situated right on the customer's premises a very speedy service can be provided.

It is important to remember, however, that the remote inplant location must obey all the relevant IATA rules for the holding of airline ticket stock. This includes, for example, the need for a safe on-site in which to store the blank tickets, fully trained staff and adequate security arrangements. In other

words the inplant must hold a full IATA licence. If, however, the remote location is using an ATB printer and ticket stock then the process is a lot simpler. With ATBs, only the passenger's ticket need be printed remotely. The other parts of the ticket for the agent's files, for example, can be directed to a printer at the agency's main office. This does away with the need to have specially trained staff at the remote satellite location who know how to process the various copies of the traditional OPTAT stock. The net result is lower operating costs for the agent and a speedier service for the customer. STP is also available on a European-wide basis. For more information on Euro-STP, please refer to the section on BSP contained in Chapter 7.

Intelligent ticketing

There is little doubt that an industry standard for the electronic encoding of travel ticket media is long overdue. The Association of European Airlines (AEA) recognized this in 1996 and instituted a study of the possibilities and feasibility of establishing standards for a common ticket that could be used for several different forms of transport. Given the appropriate standards, a single multi-modal ticket could be used by a traveller, for example, to fly from Madrid to London, stay overnight in the city and then catch the Eurostar train to Paris. Or by a transatlantic passenger arriving at London Gatwick and using the shuttle train to Victoria station in London. There are even better examples of how a single multi-modal ticket could be used in Scandinavia to travel between bordering countries by air, rail and, especially, ferry. A multi-modal ticket with data recorded on it either in the form of a magnetic strip or an embedded chip, would enable the passenger to pass through machine-controlled gates and obtain boarding passes for travel.

Unfortunately, the AEA study was terminated, mainly because there was insufficient commitment on the part of some leading travel suppliers but also because the rate of change in the industry is so rapid. In such a turbulent environment, who is going to try and 'put a stake in the ground' and commit to a set of standards for a media that may no longer exist in the next few years? Then of course there are the inevitable competitive issues. This is especially true now that rail services compete so directly with airlines between, for example, London, Paris and Brussels. To illustrate this, the new cross channel rail services have taken between 20 per cent and 30 per cent of the market on these routes, from the airlines. In any event, many rail companies are embroiled in developing their own set of standards based on the ATB. Their objectives are to allow travel agents to produce rail tickets from the same printers that they currently use to produce airline tickets. Finally, there is e-ticketing, which threatens all forms of paper-based tickets in the longer term. If e-ticketing becomes truly widespread then physical airline tickets could become a thing of the past. Consequently, the intelligent ticketing project never really got off the ground.

Smart cards

Despite its demise, the goals of the intelligent ticketing project live on in the form of smart card technology. Indeed, many of the standardization objectives of intelligent ticketing are as relevant to this rapidly evolving area as before. A smart card is simply a plastic card in which a miniature computer processor chip with its own memory, is embedded. The smart card can be read and/or updated either: (i) by passing it through a swipe device just like a normal plastic card, (ii) by inserting it into a socket with pin connectors, or (iii) by its proximity to a remote reader/processor. Smart cards could solve the problems that intelligent ticketing sought to address. They could also help support the spread of e-ticketing and some of the new travel distribution technologies, many of which are explored in this book. Evidence of the potential opportunities that are offered by smart cards may be drawn from several industry wide experiments currently taking place. For example, the experiment that IBM, American Express, American Airlines and Hilton are undertaking. This aims to test the ability of a general purpose smart card that could, in the first instance, be used primarily for business travel.

It is interesting to speculate how travellers would be affected by smart card based services, in the future. One possible way is for the service to

be based on an Internet site sponsored by either a GDS, a card issuer or even a joint venture between two or more travel and financial institutions. Customers of the service provider would be issued with smart cards that would be registered uniquely in their name. The customer wishing to embark on a trip could, for instance, connect to the Internet, sign-in to the site supporting the smart card application and then link to a GDS booking engine. A booking could be made in the GDS and the booking record downloaded for storage in the computer chip embedded in the customer's card. Downloading could be accomplished either by means of a specially adapted telephone or by a smart card reader device attached to the customer's PC. Then, with special smart card readers installed in airports, hotels, rail stations, retail outlets, ATMs and other locations, the smart card could be used to:

- Register at the airport terminal for e-ticket processing and boarding pass collection.
- Check-in at a hotel by using a self-service ATM type device to select a room and obtain an electronic room key.
- Check-out of the hotel via the self-service machine without needing to queue at the hotel's check-out desk.
- Swipe the card through rail ticket barriers to board a train.
- Obtain cash more securely from ATMs by using the intelligent authentication features of the smart card.
- Spend electronic cash by using the stored value features made possible by smart cards, at designated retail outlets adapted for this purpose, e.g. the Mondex experiment undertaken in Swindon, UK.
- Purchase goods, services, restaurant meals, fuel and other retail items, using the enhanced point-of-sale authentication and credit limit monitoring features of the smart card. This could use local card chip processing to authenticate items under a certain value with on-line authorization being required only for purchases exceeding an upper threshold, depending upon the card holder's personal profile as set by the card issuer. This could dramatically reduce the amount of on-line traffic, and therefore cost, that card issuers incur to run real-time authorization systems.
- Store personal health data in the card for use while travelling.
- Record loyalty reward points (this is already being done by a leading German airline).
- Store a full transaction profile of the card holder that would enable: (i) the card holder's travel and financial services to be finely tuned to meet their specific personal requirements, and (ii) allow suppliers to carry out some very highly targeted marketing aimed directly at the individual.

There are many more uses for smart cards but there are also a number of issues that will need resolution before much progress can be made in this area. One significant issue is the opportunities that smart cards offer to reduce the amount of fraud that is currently experienced with magnetic strip based plastic cards. It has been said that these cards have been severely compromised through counterfeiting. Interestingly, the introduction of smart cards in France has seen the level of fraud decrease substantially. This is achieved through improved authentication methods at the point-of-sale, built-in credit control and a higher barrier to counterfeiting. The ability of the smart card to be updated as it passes through the travel consumption chain is also a factor that helps reduce fraud and enhance service levels.

While it is true that the magnetic strip encoded onto ATBs can also be updated as travellers are processed through airline check-in desks, there are constraints on the future use of this technology, for example: (a) the amount of information stored and updated on an ATB is limited; and (b) the more widespread use of intelligent ATB processing outside of air, rail and ferry services in the future, is unlikely. One of the reasons for this is the cost of the equipment needed at the service point. In fact, the investment in point-of-service processing is probably the primary obstacle to more widespread use of smart cards. In the area of travel, there is no doubt that smart card readers are cheaper than ATB ticket printers. However, in the context of the global retail distribution chain, the travel agency sector is relatively insignificant. Even a comparatively small add-on cost affecting

every point-of-sale till would require a very large investment of capital indeed; and who would pay? The obvious answer is the card issuers, because they stand to gain the most from the consequent reduction in fraud. However, there are many competing arguments on this topic and it is a game that is being played for very high stakes. The dual issues of cost and funding therefore represent the principal barriers facing smart card issuers as they consider the more widespread use of this technology.

Another fundamental issue is whether detailed information is actually stored in the smart card itself or whether the card simply contains a key to information that is held in an external computer system. The GDS booking record or PNR is a particularly good example. From a technical viewpoint, the PNR could be stored completely within the smart card. However, if this is done then a number of related issues arise. For example: 'Who owns the data stored on the smart card?' If it is owned by the airline (or GDS), then could the card issuer process the data, for example, to produce integrated management information for customers? Also, how would the data be synchronized between that stored within the smart card and that stored within the GDS? Airlines sometimes have to change the booking records of their customers to reflect a service change. How would this new information update the travellers booking record if it was stored on their card? An alternative approach is for the smart card to store just the PNR locator that could then be used to retrieve the full booking record from the GDS. However, holding only a key might seriously constrain the opportunities for fully exploiting smart card technology. These are just a few of the reasons why airlines and GDSs are reluctant to give up overall control of the booking information that they store on each of their customers.

There is also the fundamental issue of: 'Who owns the smart card service?' If this is to be the bank card issuers then it will be interesting to see how alliances with airlines, GDSs and other travel suppliers develop. Finally, there is the biggest issue of all – standards. Standards are pivotal to the success of smart cards in travel. Without standards, the uses that I have identified above would not be feasible. Standards that define how the data are recorded within the chip and what form of security and encryption techniques are used. The problem is that these standards need to be agreed throughout the travel and financial services industries and between competitors. A very challenging issue, but one that should not be ruled out as unattainable. After all, when the stakes are high in terms of financial pay-off, there is an enormous drive for standards to be agreed. There are anyway, plenty of examples of intra-industry, intra-competitor collaboration in the standards field, e.g. EDI and the current magnetic strip plastic cards. So, the signs appear to be quite encouraging; and a great deal of groundwork has in fact already been done in establishing basic standards for the multiple use of ATBs, electronic tickets and smart card data storage. Nevertheless, this whole area is one that is rife with issues although at present, i.e. mid 1997, it is also bereft of solutions and definite directions. Smart card technology in travel and tourism will be one to watch over the forthcoming few years.

Hotels

There is little standardization in the area of hotel systems. The kinds of technology used throughout the hospitality industry, while bang up-to-date, vary widely depending upon the size and type of hotel. However, there is a lot going on in the area of IT within the hotel industry. Some of it is in the high profile area of distribution and the Internet is a prime example (see Chapter 5). But hotel back-office systems are becoming increasingly sophisticated and are now widely recognized as being a key to improved profitability; and it doesn't stop there. Guest services are the current focus of attention and there are some really interesting experiments being conducted on a large scale. For example, Hilton, American Express and IBM are jointly exploring the opportunities offered by smart cards. Finally, in-room technology is rapidly becoming a very real competitive differentiator, especially at the top end of the hotel market. So, first of all, let me try and categorize the different ways in which hotels implement their systems. These really fall into three main areas: (a) in-house systems owned and operated by the

hotels themselves, (b) packaged systems that are purchased from software companies, and (c) outsourced systems where a third party will run all or some of a hotel's application functions. Let's take a look at each of these in a little more detail:

- **In-house** Many of the larger hotel chains have managed to develop their own in-house systems over a period of several years. Some of these systems have been purchased from other hotels and even other suppliers in related industries. They have been modified to suit chains' individual needs and have developed into an important operations and distribution capability upon which their businesses have become highly dependent. However, not many hotels develop their own systems these days; it is considered far to risky and expensive a venture, which can detract a hotel from its core business.
- **Packages** Small to medium sized hotels may also develop their own systems but more usually, they purchase a pre-packaged system available from one of the many software companies specializing in the hotel sector. There are now a wide range of packaged systems available to hotels, each providing a specific function. I'll be taking a look at these functions and different types of packaged systems in more detail in a moment.
- **Outsourced** Some hotels find the outsourcing option very worthwhile. There is now a wide choice of different outsourcing options available to suit hotels seeking to automate specific areas of their operation. This can be attractive to smaller hotels that do not wish to invest in running systems themselves.

I am going to concentrate primarily on the packaged and outsourced solutions in the remainder of this section. The reason is that in-house systems are by their very nature unique and therefore not really representative of the industry. It is the packaged and outsourced systems supplied by third parties that are particularly relevant and interesting. The blanket term often used to describe the systems that support hospitality industry automation is a property management system (PMS). However, this terminology has been somewhat abused and there are in fact many more functions that can be automated by specialist application software. Let me put PMSs into context with other systems that are frequently used throughout the hospitality industry:

- **Property management system (PMS)** This is probably a hotel's core system. It maintains all details that describe the hotel, such as the size, type and number of rooms, the rates applicable for rooms and other facilities, and all details concerning guests. It supports guest check-in (also known as front desk support) and check-out functions, which produce guest bills and record payment. At any point in time, the PMS may be used to determine the status of a room, e.g. clean and vacant or not yet made-up. Hotels usually implement their PMS on an in-house computer. That doesn't mean to say they usually have an in-house IT department to support it. Most PMSs are turn-key systems that, as the name implies, are simply turned on and off by hotel staff.
- **Self-service kiosk systems** This is a new area for many hotels and is the subject of much experimentation at present. Self-service kiosks are an attractive way for a hotel to reduce guest check-in and check-out procedures while at the same time reducing the load on the front desk staff. It is, however, widely recognized that self-service kiosks will not be used by all guests. Nevertheless, business travellers who are becoming increasingly computer literate may wish to swipe their cards through a self-service machine, select the check-in menu and then choose their rooms from those currently available. It is quite possible for these self-service kiosks to issue an electronically encoded room 'key' and a printed set of personalized instructions for the guest. If this saves a tired business traveller 15 minutes queuing at the front desk and going through the old familiar check-in question-and-answer session, then the traveller may well prefer the self-service kiosk. Especially if the same kind of time savings can be enjoyed on check-out.
- **Reservation systems** These systems control the forward inventory of hotel rooms. The hotel maintains an inventory of the rooms available using its PMS. This is complemented with

additional information, such as periods when the room or rooms are blocked out as unavailable. The reservation system allows operators, or more generically, users, to allocate a room for a specific period of time to an individual. There are many instances where hotels outsource their reservations function. The reason for this is that reservation systems are expensive. They require non-stop computer systems, on-line applications and plenty of capacity in order to ensure busy times are covered. This all adds up to high operating costs. Sharing these resources with others via an outsourced operation can be attractive to small to medium sized hotels.

- **Point-of-sale systems** These sub-systems comprise payment handling devices that produce bills and accept various financial instruments from guests, e.g. credit cards, cash, guest cards and so on) Depending upon the hotel's size and level of sophistication, these point-of-sale devices are linked by communications lines to a central communications processor that in turn is linked to card authorization systems. The systems also feed transaction data directly into the hotel's accounting system, which is often integrated within the PMS.
- **Food and beverage systems** These systems control the food stock required for the hotel restaurant's various menus. It allows changes in suppliers' prices to be evaluated against projected customer demand for certain menu items and, as a result, enables the restaurant to optimize its order position with alternative food suppliers.
- **Back-office systems** This is the term given to a set of systems that records all transactions, and maintains the hotel's books of account. These systems receive transactions from the other sub-systems, as described here, and compile data on the hotel's expenditure and income. The systems support the purchase ledger, i.e. accounts payable, the sales ledger, i.e. accounts receivable, and the general ledger. A full set of financial accounting reports is usually included within this suite of systems.
- **Sales and marketing systems** These systems store a vast amount of information on virtually all the key parameters that are used to measure the accommodation and hospitality business. Of particular importance is a customer data base that can profile individual guests and is a powerful source for pull marketing (see Chapter 5 – The Internet). Another important function is yield management. This enables a hotel to review the past performance of its rooms, e.g. occupancy levels, average length of stay), and set the optimum rates that will maximize the property's yield management programme.
- **In-room systems** Successful hotels are constantly striving to adapt their services to meet the needs of their customer base. These days, hotel guests, particularly towards the upper end of the market, are becoming increasingly technologically oriented. Business people need to access the Internet, principally for e-mail purposes, during their business trips. They sometimes find video-conferencing useful, especially when a company holds a business meeting in a hotel; and there are many other examples. While not all hotels will cater for sophisticated IT services, there is a pressing need for basic resources to be made available to business guests, such as Internet plug-in points, power sockets for portable PCs, in-room PCs, faxes and overhead projection facilities.

As you will no doubt gather, there are a wide diversity of support systems that need to be used by hotels. The problem is that there are very few software suppliers that can deliver an all embracing and fully integrated solution to a hotel's automation needs. While one software company may be particularly strong on core PMS systems, its food and beverage package may be weak; and so, hotels are forced to go to different software suppliers for different applications. Naturally, there are several software company's that claim an all round automation capability; but, nevertheless, hoteliers are faced with the issue of: 'Whether to choose a reasonable all-round system from a single supplier or choose several specialist application packages from a number of software suppliers?' This is not an issue that is easy to resolve; and it leads on to the second problem faced by hotel management wishing to automate – standardization.

I have discussed standardization before in the context of several areas of travel and tourism automation (see Chapter 1 and TTI). Sadly, in the area of hotel automation, there is very little compatibility between sub-systems supplied by different software companies. Therefore, unless a hotel chain puts all its eggs in one basket and opts for a single software package providing all-round functionality, then it faces a serious obstacle to future growth. Even if a single package is chosen, the situation can still mitigate against the hotel's original choice. Say the hotel branches out into an area of the business that is completely new. Its single system chosen by the hotel in its formative years may not provide the required functions for the new service. So, another software supplier's system needs to be obtained and the hotel is straight-away faced with the old problem of incompatibility: 'How can the new system feed data to the old system so that management can enjoy integrated accounting tools and overall management control of their entire business?'

The problem of non-standardization seems to be just as bad all around the world. There seems to be virtually no consistency between different systems. This problem has often inhibited mergers and acquisitions between hotel groups. After all, how can a hotel buy another if its entire inventory and room management systems are entirely different. OK, they can be changed and one hotel's systems can be migrated to the others. However, this is a costly game to play and there have been instances where the migration effort has had to be abandoned at great cost. Only in the USA does there appear to be light at the end of the tunnel. The Hospitality Industry Technology Integration Standards (HITIS) project has been initiated by the American Hotel and Motel Association. This group has been charged with evaluating the possibility of establishing standard interfaces between various types of hotel systems, e.g. between PMSs and POS devices, between PMSs and central reservations systems, between PMSs and food and beverage systems). The only drawback is that there is no representation on this body by either Europe or any of the other major trading blocks around the world. However, the project represents a serious attempt at addressing the standards issue, as evidenced by its 23-strong committee including three members from Microsoft. Its mission statement is:

> 'To direct a non-proprietary, consensus based process to develop voluntary standards for the integration of evolving computerised system and sub-system transactions in the hospitality industry. The process will seek to synthesise and disseminate previous and current efforts to resolve such issues and allow hospitality operators and vendors alike to save on costly retrofitting solutions and enable faster technology adoption and evolution within the various segments of the hospitality industry.' More information can be found at **http://www.hitis.org**.

This has been a quick overview of the kinds of systems that hotels used to manage their operations and control their inventory. I won't be discussing distribution systems in any more detail here because this topic is covered by several subsequent chapters, i.e. GDSs, videotex and the Internet. However, there are a few other miscellaneous aspects to hotel automation that you need to know about before we embark on the alternative distribution channels. I have discussed each one below:

- **Room rates** There are many different types of room rates that hotels offer to various categories of guests. Business travellers often pay peak rates because their visits are booked at short notice, during peak times of the week and they require a higher standard of accommodation. However, partially offsetting this is the willingness of hotel chains to grant special rates to certain companies that deliver a high volume of bed-nights to their hotels. By contrast, holiday-makers book well in advance, stay at off-peak times, e.g. weekends, and do not always require such a high standard of room. Leisure travellers are often able to enjoy special bargain breaks and deals that involve complimentary or reduced price meals. Each type of guest is therefore allocated a different type of rate by the hotel, even if they stay in the same room. So, in order to understand hotel systems, it is worth spending a little time introducing some basic terminology in relation to room rates. It seems that each industry has its own jargon and buzz words and the hotel sector is no different in this regard. These may be summarised as follows:

- *Rack rate* This is the full rate as published by the hotel. It is the rate for a room that does not include any discount at all. In other words it is the rate that you or I would probably be quoted by the hotel if we were to walk in off the street and ask for a room.
- *Corporate rate* This is a special rate that is strictly only available to business or special users of the hotel. It is a rate that a hotel may give under its own discretion in exceptional circumstances.
- *Negotiated or preferred rate* This is a rate that is negotiated by a travel agent or a company directly with a specific hotel. It is usually dependent upon a minimum amount of business volume and is available only via the party that negotiates the rate. A travel agent with a large business house account can often negotiate a special rate on behalf of his/her corporate customer.
- *Promotional or weekend rate* These rates are only available via a package that the hotel arranges and provides for its guests. Packages often include a meal plan and some other activity organized by the hotel. Promotional packages are usually only available at weekends and are aimed at filling rooms unused by business guests that are the mainstay of a hotel's trade during the working week.
- *Net/net rate* This is the lowest possible rate and as such is one for which the hotel does not pay a commission. Some hotels will, however, supply certain special customers with rooms on this basis. Despite the fact that these bookings represent loss making transactions, they are nevertheless supported in order to provide an all round service. Many reservation systems do not support a net/net rate because there is no way for the hotel to recover the cost of making the booking.

- **Assured bookings** In the past it was sometimes the case that hotel reservations were subject to the dreaded 'lost booking' syndrome. This occurred when a travel agent made a reservation for a customer in a point-of-sale system that appeared to have worked perfectly. The trouble used to be that the travel agent's message to the hotel was never successfully delivered. Consequently, when the customer turned up, there was no reservation and everyone involved in the booking blamed one other. Once a problem like this is experienced, the word soon spreads that hotel systems are unreliable; and it takes a long time to re-build lost confidence. Since then, distribution systems have improved dramatically and hotel switches have virtually eliminated this problem.
- **Travel agents' commissions** As far as hotel commission payments are concerned, travel agents used to regard themselves as lucky if one in ten bookings resulted in a commission cheque being received from the hotel. From the hotels' perspective, they were faced with dealing with hundreds or perhaps thousands of very small commission cheques that were mailed to hundreds of travel agents all around the world. Travel agents had to deal with individual cheques worth only a small amount each and often written in a foreign currency. All in all, neither the travel agents nor the hotels were very impressed with the old hotel booking and administration process.

  However, a lot has been done to solve these problems over the past few years. The hotels have realized that in order to obtain a greater proportion of their bookings from travel agents they need to make the process as simple and as accurate as possible; and there is substantial potential to be gained by hotels from travel agents. At present only about 28 per cent of hotel bookings are generated by travel agents. The remaining 72 per cent are booked directly by consumers or companies. One of the facilitators that will enable the travel agency distribution network to be a prime source of hotel business growth is the widespread use of GDS technology. This has tended to not only cure the problems I outlined above but has made it less costly and therefore more profitable to handle hotel reservations, provided they are done using computer terminals and not over the telephone. A telephone call takes a lot of selling time and can cost a lot of money.

The key issue for a hotel is yield management. This is a term used to cover the process of applying the

most effective rate to a room in order to maximize overall revenue for the hotel. This is a balance between: (a) charging the highest possible room rate, but running the risk of fewer bookings; or (b) filling all hotel rooms, but at a lower rate. Obtaining the optimum balance is an exercise in pure economic theory. Too high a room rate and you will not attract sufficient numbers of guests to make a profit. Too low a rate and you will not receive sufficient income to cover your operational costs. Reservation systems have helped hoteliers with this problem. Systems have enabled hotels to shift the focus of their rates away from fixed room types each with an associated rate, and instead to move towards having individual rates for each room.

Take, for example, a hotel with 20 rooms, of which five are superior suites, ten are twin bedded rooms and five are single rooms. The classical approach taken by the hotel to market these rooms was to assign a rate to each of its three room types for each season of the year. Although this works OK in practice, it can be inflexible, particularly in times of either high occupancy levels or lulls when many rooms are empty. What many hotels are now doing is to designate all their rooms individually, each with its own rate that varies from time to time. In our example the hotel would describe each of its 20 rooms individually and assign a price to each one. Each room is described in terms of, for example, a room with two beds having a view of the sea from the top floor with a South facing balcony. The room would be assigned its own particular room rate that would vary not just by season but interactively depending upon the hotel's occupancy levels at any point in time. This approach is more flexible and allows the hotel to achieve a far higher degree of control over its rates depending upon current and forecast occupancy levels. So, if eight of its old style twin bedded rooms were taken, the remaining two could be priced slightly higher. Pure market economics.

Now this would have been rather difficult to achieve before the advent of computerized reservation systems. But with an on-line system that can be updated rapidly using computer terminals, an individual room can easily be assigned a rate that varies on, for example, a daily basis. Another supporting factor has been *seamless connectivity*. With *seamless connectivity*, end users accessing the hotel's reservation system via a GDS can see their displays exactly as they are formatted by the hotel's own system. In the past, GDSs have edited hotel displays because they could not show them in the same format as the screens that the GDSs use for airline availability. Most GDSs and other booking channels, such as the Internet, now support *seamless connectivity* to hotel systems. Hotels that have adopted flexible pricing for individual rooms have enjoyed a higher yield, which should mean increased profit. It does, however, place increased demands on hotel general managers to possess marketing and entrepreneurial skills in preference to classical abilities focused on running an efficient hotel operation.

This has been a brief look at how hotels use IT to automate their in-house operations. As I have mentioned before, it is important to understand these systems because many of them provide a platform for alternative distribution channels which are the subject of subsequent chapters. Finally, let's take a closer look at a particularly good example of a hotel chain that uses technology very effectively – Marriott Hotels.

MARRIOTT

Marriott International is a hospitality management company. Lodging products and services include International hotel brands such as Ritz Carlton, Marriott Hotels and Resorts, JW Marriott luxury hotels, Courtyard by Marriott, Fairfield Inn & Fairfield Suites by Marriott, Residence Inn and Townplace Suites by Marriott, Executive Residences by Marriott, Marriott's Vacation Club International, Renaissance International, New World, Ramada International and Marriott Conference Centres. One of the key success factors in Marriott's growth over the past few years has been their central hotel reservations system called MARSHA (Marriott's Automated Reservation System for Hotel Availability). MARSHA was developed in the 1970s and used airline reservations systems technology as its platform. The software which supports this platform is IBM's TPF (Transaction Processing Facility). TPF is a sophisticated piece of software designed to run (not surprisingly),

on IBM main-frames. Its key strength is its processing efficiency which enables extremely fast response times to be delivered to large populations of reservation operators using main-frame linked terminals. One of the ways it accomplishes this is by the use of clever coding systems which reduce the size of a reservations message and its response to just a few characters. However, as we shall see later, this technology, although still very fast and efficient, does not lend itself quite so well to graphical based GUI systems and messages which comprise large amounts of data.

MARSHA is used by Marriott as the group's central reservations facility. As such it is connected to all of the world's major GDSs (Global Distribution Systems) which also operate on a TPF platform, and from these systems to PC terminals used by travel agents at the point-of-sale. They also connect to some lesser volume producing GDS's and the Internet via the Thisco switch (see Chapter 5: Distribution Systems) MARSHA is also accessed by Marriott's central telephone reservations operation which is housed in a purpose built centre in Omaha Nebraska in the US. This centre, chosen for its central geographic location within the US, houses around 1,600 telephone reservations operators who work shifts to provide round the clock service worldwide. Each operator uses a telephone headset to receive incoming telephone calls and is able to provide customers with live information on all of the chain's properties around the world using their MARSHA computer terminal.

MARSHA has been an excellent platform to support the growth and development of Marriott's hotel brands and its associated businesses. One of the basic reasons why Marriott have been so successful in exploiting technology to support their business is a clear information systems strategy. The keywords here were and still are, uniformity and standardisation. Marriott always made it a rule that any property or franchise which joined the Marriott chain must have a PMS (Property Management System), which is compatible with MARSHA and which can support a two way automated link between the two systems (i.e. between the property's PMS and Marriott's MARSHA). This is a fundamental axiom which guarantees last room availability to Marriott's customers. This is so important that it is worth explaining it in a little more detail. When a Marriott telephone reservationist uses MARSHA to inquire on the status of a room in a specific property, they may for example see that only one room is left for sale on a given date. If they are going to be sure that they can sell this room, they must be able to rely 100% on the accuracy of the MARSHA data base. This is possible only because the central MARSHA reservations system is in a continual two-way dialogue with the PMS used by the property concerned. So, if the PMS has one room available then Marriott's automated reservation system for hotel availability (MARSHA) will show that room as available for sale. Once the reservationist sells that room for the date specified, it is not only recorded as such in MARSHA but is also immediately communicated to the hotel property's PMS. The two systems are therefore always in synchronization, thus guaranteeing the quality of the information available to central reservations. Today, over 98 per cent of Marriott's properties use an on-line two-way link between MARSHA and their PMSs.

The benefits of Marriott's reservations systems standardization strategy have also paid off in the area of GDS interconnection. In the early days of the 1980s when GDSs were known as CRSs and they focused almost entirely on airline reservations, the inclusion of hotel and car services was a revolution. So, when Marriott established a direct connection to the System One CRS in 1987 it was breaking new ground. This was followed in 1989 with a fully automated link to Sabre in 1989. Marriott connected MARSHA to the Apollo, PARS and Abacus systems progressively over the ensuing two years. This GDS–CRS interconnection was no trivial matter for either parties. There were significant developments that the host CRS–GDS systems had to fund and there were similar modifications also required to MARSHA. After all, when you think about the basic products, i.e. airline seats and hotel rooms, they are fundamentally different in many ways. Airlines have fields such as departure–destination city pairs, and a number of seat classes: hotels have a range of room grades and special accommodation packages. It is because the two products are so different that these modifications had to be made to the systems involved. Eventually, Marriott, like many other hotel chains,

decided to establish a single connection to a hotel industry switch called Thisco. Thisco could then take on the onerous job of interconnecting to the GDSs on behalf of their hotel members (see Chapter 4 for a full description of Thisco). Today, electronic reservations generated by all hotels via the GDS channel have grown from 25 million in 1995 to over 33 million in 1996.

Clearly then, Marriott recognizes the importance of its reservations system in supporting profitable, high quality, customer service led growth. The company continually strives to enhance and develop MARSHA further to provide its customers and users with a higher level of service. Over the past few years, the population of MARSHA's GDS travel agency users has grown significantly, especially in the USA where 80 per cent of all agency hotel reservations are now made via GDSs. The problem has been that this percentage is far lower outside the USA. In Europe, for example, during the early part of 1995, travel agents made only 2 per cent of their hotel bookings via GDSs. Although this has grown steadily to over 50 per cent by 1997, a continual programme of enhancements is needed to drive this growth further in the international arena.

One such enhancement goes under a number of terms, such as Galileo 'inside availability' and Sabre 'direct connect availability' (again, see Chapter 4 for more information on these GDS terms). However, they all refer to the 'seamless' functionality that allows a GDS user, i.e. a travel agent, to use their terminals just as though they were connected directly to MARSHA. There is no translation undertaken by the GDS and the travel agents see the displays just as MARSHA formats them. To support this, MARSHA was upgraded to MARSHA III in 1995. The new system now supports full room descriptions, rate details and many other important fields just as they would appear on a native MARSHA screen. This is particularly important when a user is discussing a customer's requirements and trying to decide on a room type. Does the code for superior twin-deluxe room in one system mean the same thing in another, for example. With the new comprehensive MARSHA descriptions, the review and decision process can be made in the comfort that it is based on higher quality information.

Despite the success of Marriott's automation programme, today's consumers expect the systems they use to support full multi-media technologies and GUIs. Although travel agents may be happy to continue using text based GDS systems for some years yet, even they may eventually come to expect a next generation reservation system. This is one of the reasons why Marriott has expanded MARSHA to provide a full information, reservation and payment facility using the Internet. This whole area is explained in more detail in Chapter 5 – The Internet.

Tour operators

Tour operators are in the business of combining travel products from several suppliers into unique holiday packages that are marketed to consumers. So, they are: (a) very much in the leisure business, and (b) highly dependent upon successful inventory control for their profitability. As with airlines, most of their sales originate via travel agents (although some direct sell tour operators are beginning to emerge). It is therefore vital that a tour operator's performance objectives include such factors as: the availability of systems that enable internal operations to run effectively, networks that enable their products to be booked easily by travel agents, and reporting systems that enable information on sales to be tracked on a current basis. IT is a key success factor in helping tour operators achieve these performance objectives.

Tour operators aim to save their customers the hassle of booking their own flights to their destinations, searching for the best and most affordable hotels and coping with all the ancillary chores that go hand in hand with foreign travel. Chores such as baggage handling, transportation between the airport and the hotel, tips, sightseeing tours and, last but not least, the language. The tour operators do this at the lowest possible cost by buying in bulk, packaging all the required services into an all inclusive holiday and selling this package to customers via travel agents.

The process starts a long way in advance of the date that the holiday will actually take place and it commences with the holiday design phase. The tour operator's marketing staff decide upon

the type of holiday that they think: (a) will fit the operator's image and reputation, (b) will sell sufficiently well enough to make a decent profit, and (c) will appeal to the type of customer that the operator is targeting. Having decided upon the holiday design and specification, the operator will despatch its buyers to the destination resorts to negotiate the number of rooms needed to satisfy the expected demand for the holidays being sold. In most cases the hotel space is arranged one to one-and-a-half years before the season. Aircraft seats are also obtained a fair time in advance and these are obtained in blocks. Then there is the uniformed representatives to arrange and all the other ancillary services to purchase. While all this is going on, the brochure is being printed. To control this process the operator creates a large inventory of travel products that have been contracted with the various suppliers, e.g. charter airlines, hotels, local transportation companies, etc. This inventory is stored on a computer data base.

In these early stages of a packaged holiday's life, the data base provides the operator with a control mechanism to ensure that the required services are in fact contracted and that the rates and conditions are stored for pricing purposes. The operations staff work in conjunction with the marketing staff to link the services contracted with the tour package to be marketed. This is how the tour cost is calculated and the selling price determined, which in turn allows the inventory to be created. It is this tour inventory that is referenced each time a customer enquires about a booking. Now, let's look at an actual example of a tour company and how it uses IT to control its business operations.

COSMOS

Cosmos makes very effective use of IT to support the distribution of its package tour, coach tour and seat only businesses. But before we plunge into a review of this company's deployment of IT, it is worthwhile considering how Cosmos came into existence and understand a little more of the background that led to it becoming a leading supplier of package holidays. Cosmos is owned by the Globus Group. Globus itself is a private company, which was formed in 1928, and is run from its headquarters in Lugano, Switzerland. Globus focused initially on selling coach tours within Europe. Then in the early 1960s, Globus decided to enter the packaged tour business from the UK and created Cosmos. Soon after this, Cosmos formed Monarch, its own charter airline, to support its new package holiday business. Globus then moved into the USA market with the acquisition of Gateway Tours, which provided both air travel services into the USA linked with coach tours of the country and a growing market for the supply of coach tours of Europe including the British Isles. Globus and its TOURAMA coach programme, is now the largest coach tour operator in the world. It has general sales agents (GSAs) and associates in most of the major destination countries of the world. More recently, Globus acquired Avro, which is a leading seat-only air travel supplier, and in 1995 followed the general industry trend towards vertical integration with the acquisition of a leisure travel agency chain called Apollo Travel. Apollo has five retail outlets and a large telephone sales operation.

It is interesting to consider the way in which Cosmos has deployed its IT resources during the time of its fairly rapid growth. The two main drivers of Cosmos' automation programme have been: (a) communications networks that link tour operations' headquarters with destination service offices overseas, and (b) distribution systems that provide direct access to travel agents for sales support. Let's take a more detailed look at both these areas:

- **International communications** Cosmos has adopted a distributed approach to systems development but with a firm control on technology standards. This has dual benefits: (i) it allows destination areas to have the flexibility to develop the systems they need for their own local operations and (ii) it ensures that the overall business retains a high degree of compatibility across all its different systems. Cosmos uses Microsoft products for local applications development and office automation. This started with the simple need to transmit a rooming list from Cosmos' headquarters in the UK to a destination office in a resort area. This commonly used function has been

gradually enhanced over the years using standard Microsoft Access products. It is currently an application that is initiated by the destination office by dialling into the company's computer system and downloading a rooming list file for local printing. The format of the transfer is EDI and this enables the local destination office to import the file into its local data base.

Globus and its Cosmos subsidiary have a growing need for international telecommunications services. The rooming list example I gave above is just one of the many applications that need to be distributed around the world. There are many others. Cosmos needs a telecommunications network that is: (a) available as and when needed, i.e. not necessarily permanently on-line; (b) capable of providing the high transmission speeds that its business applications require; and (c) is cost effective. As business volumes grow at Cosmos, this requirement for a global telecommunications service will increase in importance to the company.

- **Distribution system** Cosmos launched its viewdata booking system in 1988 when it had become clear that videotex was a technology that the majority of travel agents had committed to. The Cosmos main-frame, an ICL VME computer, was enhanced with multiple front-end communications processors. These each have a direct connection into the two leading networks that distribute videotex access services to travel agents throughout the UK (see Chapter 6 for more details on these communications network companies). The configuration used by Cosmos offers a high degree of reliability and integrity due to two main factors: (i) the host main-frame is insulated from the communications processing functions that pose a higher level of interference risk, and (ii) the multiple front-end configuration allows for either a single computer or communications link to fail without necessarily shutting down Cosmos' entire distribution system (see Chapter 6 for more information on Cosmos' videotex distribution system).

Cosmos decided some years ago that because its core business was tour operations, it would outsource its ICL main-frame and front-end computer operations. The overheads in terms of staff levels and skills required to run such an operation are considerable and Cosmos decided that it would be best to let a professional computer service company provide these services. These computers were therefore outsourced to the SEMA Group, which houses the computers and provides a full physical operational environment for them: although the Cosmos ICL main-frame and front-end computers are actually located and run off-site, they are nevertheless controlled and operated remotely by Cosmos' own operations staff. This enables Cosmos to concentrate on its local in-house office technology and overseas destination service support systems. So, the various departments, such as accounting, reservations, administration, contracting and aviation control, all run their own PC networks that are either based on Novell or Microsoft Windows NT network operating systems.

However, outsourcing your computer operations does not remove the responsibility for applications development and maintenance. Cosmos has decided that for sound strategic reasons, it will migrate its main-frame operating system environment and the associated applications to an open systems architecture. This means converting its current main-frame environment to a UNIX-based operating system. This allows for more 'openness' – in other words, a wider choice of hardware platforms and applications support software, e.g. data base management systems. Having reviewed its options for information management, Cosmos has opted for a standard flat file approach for core operational systems rather than using newer technology such as relational data base management systems. The reason for this is that speed and end-user response time are the critical factors that determine Cosmos' required service levels. While relational data base management systems are excellent for data manipulation, e.g. management information and enquiry systems, their inherent flexibility gives rise to a processing overhead. Flat files are better for straightforward fast processing of repetitive transactions in a real-time on-line environment.

The Cosmos tour reservation system, like many others, uses a technology called 'inside access' to review, obtain and confirm scheduled airline seats.

This is an interesting function and one that is worth examining in a little more detail because it will no doubt be used increasingly by tour operator systems in the future. When a Cosmos reservations operator receives a call from a travel agent wishing to book a package tour for a customer, the operator needs to provide instant confirmation of the booking. If the package tour happens to use a scheduled flight then, historically, the only way of providing an instant confirmation was to put the travel agent caller on-hold while a separate GDS terminal was used to check availability and make a booking. This is because airlines are reluctant to allow tour operators to hold allocations of their scheduled flight seats in the hope that they will all be sold. If the tour operator does not manage to sell their allocation, the airline is left with the job of selling these seats, usually at the last moment. This often involves selling the seats at a discount and consequently loses the airline valuable flown revenue. Instead, airlines prefer tour operators to use their GDSs to access their seat inventories and book those actually needed by their customers.

With 'inside access', this is done automatically by the tour operator's system. The reservations operator first uses his/her in-house tour system's reservations function to select the desired package holiday from the inventory. This presents the operator with one or more screens of information about the holiday. Then, when the travel agent enquires as to the availability of the holiday, the operator selects an availability-check function. In the background, the system links directly to the tour operator's chosen GDS, sends an availability request transaction, receives the response and displays this to the reservations operator. This exchange is accomplished entirely automatically using a set of machine-to-machine EDI messages without the operator being aware of the dialogue with the GDS. A booking is made in a similar way; the inventory is decremented and a booking message sent to the GDS to reserve the scheduled airline seat. Inside access is now also an integral part of the viewdata booking system and is an important new technology that has helped Cosmos improve service levels and increase the productivity of its reservations operations while also maximizing airline seat revenues.

Like most other tour operators, Cosmos is facing several important business issues, many of which relate to distribution technologies. Because these are closely linked to viewdata and the new Internet-related technologies, I have discussed them in more detail in Chapters 5 and 6. However, I hope this short analysis of Cosmos has given you an insight into the technologies used by tour operators that often also represent their platform for product sales distribution.

Rail companies

By its very nature, rail travel is run on different lines in different countries (you can't argue with that, can you?). This national culture of the railways is reflected in the systems and technology that are used to support the sale of rail tickets. Systems differ widely across different countries and there is no clear or consistent pattern to these systems. So, I shall pick the UK as an example of a country that has a thriving national rail network and that uses IT to sell its product.

Rail travel in the UK

Rail travel in the UK has undergone a radical shift in its core infrastructure during the 1990s as a result of the privatization programme initiated by the British Government. The old monolithic British Rail network has been broken up into two main components: (i) Railtrack – which operates the railway lines, switching points, bridges and stations; and (ii) the train operating companies – each of which operates the trains in various regions of the country for a contracted period of time. In addition to this there are several support organizations that deliver specialized services to the businesses. All of these individual entities are monitored by the rail regulator, an independent authority that is appointed by the Government to ensure fair play, appropriate pricing and the delivery of a consistent service to the public.

Rail tickets are sold to travellers by the train operating companies. Each of these train operating companies are required by the regulator to be a member of the Association of Train Operating

Companies (ATOC). This is strictly an association and is not a trading company, although it does appoint companies to perform certain support functions as part of a commercial arrangement. One of the main functions of ATOC is devolved to a group designated the Rail Settlement Plan (RSP). This group is principally responsible for ensuring that the revenue derived from the sale of rail tickets by whatever means, is fairly and equitably shared among the train operating companies. So, for example, a ticket from Brighton to Edinburgh will be purchased as a single ticket at a pre-set price. However, this ticket revenue must be apportioned between Connex South Central, the London Underground and Great North Eastern Railways. The ability to do this is provided by a complex set of inter-related systems that have been developed over many years by different parts of what used to be British Rail. Responsibility for the operation and development of these systems has been contracted-out by RSP to the SEMA Group, a large European facilities management company.

SEMA is therefore responsible for what used to be known as the British Rail Business Systems (BRBS). The portfolio of systems that are supported by this new group are many and varied. They include: (i) the large and powerful central main-frame computers located in Nottingham and Crewe; (ii) the point-of-sale systems used to distribute ticket sales to travellers; (iii) the information systems that support the retail sales activities, such as the telesales centres; and (iv) the revenue accounting systems that feed the train operating company's general ledgers. Let's take each of these types of systems in turn.

Central main-frames

There are two main-frame computers located in Nottingham and Crewe, each of which is capable of processing the other's work. This provides a fail-safe computing environment that safeguards the network against failure of a single facility. These computers hold the rail inventory that comprises timetables, reservations and fares:

- **Timetable** The operating dates and times of every train run by each train operating company is stored in a large data base called the computer aided timetable enquiry (CATE). This data base is updated daily by an interface from Railtrack's train planning systems. The CATE data base is the core of many other systems, some of which I will be explaining in more detail in a moment.
- **Reservations** This application, known as the central reservation system (CRS), supports train seat reservations and APEX yield management. It contains a great deal of information on stations, routes, restrictions and holds all retailing rules.

  Depending upon the response to a timetable enquiry, as described above, a reservation may be requested. This is made on a special purpose screen that asks for position (window or aisle), direction (facing or non-facing), dining seat, smoking/non-smoking or sleeper compartment. Only those facilities available on the train service requested are shown. Where a reservation is made for a customer, the rail main-frame computer in Nottingham creates a PNR, so that the reservation may be recalled at any future point in time for customer service purposes.
- **Fares** The fares data base is called the central prices file (CPF) and is enormous. It holds over 54 million individual fares. The reason it is so large is due to the commercially oriented pricing strategy established by British Rail many years ago. In essence, this strategy considers every single possible combination of origin station, destination station, route and class in the entire network as a possible individual fare. The rail main-frame computer system that runs CPF provides access to the fares data base and makes selecting the best fare deal for a customer very straightforward. Besides showing fare options, CPF can also show fares by ticket type. Most of the information that is needed to produce a ticket, including the fare, for example, would already have been entered as part of the reservations process described above. However, additional information may be added prior to ticket printing. This could include, for example, the form of payment. This may specify the usual means or a combination of payment methods.

  The fully automated customer enquiry terminal system (FACETS) enables an itinerary

to be planned for a customer by entering the from and to cities (in fact either the full names of the cities or the three-letter codes for cities/towns may be entered), the time of travel and the type of fare requested. The system responds with a screen showing the suggested itinerary as specified. For each leg of the itinerary, i.e. the from/to stations involved in each train journey, the system shows the station name, the departure time, arrival time, the accommodation available on that train, whether it may be reserved and, finally, whether there is any available space to be reserved.

The central main-frame system represent the core around which both current and future UK rail automation systems are based. This core comprises a number of systems that are highly inter-related and some of which are being released in stages over the next few years. These systems, originally known collectively as the joint distribution system (JDS), also support the point-of-sale rail functions that I will describe in more detail in a moment. The JDS product was first demonstrated at the 1992 World Travel Market in London.

The JDS was so called because the intention was to support jointly the reservations and operations of both the UK's train operating companies and European Passenger Services Ltd. The latter, which became Eurostar UK Limited (EUK), operates the new channel tunnel based rail service to the continent. These services that are branded 'Eurostar', operate principally between London and either Paris or Brussels, and started operations in 1994 when the tunnel opened. Cross-channel car and passenger services are provided by a separate train operating company called Le Shuttle. The original concept was that a single PC system would have access to both the UK rail main-frame computer in Nottingham and the EUK computer in Lille. As it has subsequently turned out, there are two systems in current use: (i) the Tribute system, which is aimed mainly at in-house rail servicing points; and (ii) the TSG system, which is the strategic travel agency point-of-sale system. Both systems derive most, if not all, of their data from the main-frame systems in Nottingham and Lille. I have explained each one in more detail in the following sections.

Having said this, two factors need to be recognized: (a) the central main-frame in Nottingham will continue to be the platform for all automated UK domestic rail services, and (b) the local train operating companies in the UK are perfectly free to develop their own systems, e.g. for marketing to travel agents and for internal use in local rail stations and booking offices. The latter point may become more relevant as time goes by: so, for the moment, I've chosen to concentrate solely on ATOC's main-frame systems in Nottingham and Crewe because they have the most significant potential for domestic rail travel in the UK.

Point-of-sale systems

Over the past two or three years, ATOC has been focusing on developing the next generation of technology to support sales from its own ticket offices as well as travel agents. In particular, it has recognized the trend among travel agents towards the more widespread use of GDS PCs and the necessity to produce automation products that are inexpensive and easy to use. This has to a large extent been driven by the need to support new products, such as the continental channel tunnel services, and the desire to direct more ticket sales via travel agents, especially for business travel. The expectation is that travel agents will be selling a higher volume of more profitable rail products in the future and that this will be accomplished to a large extent by using sophisticated point-of-sale technology. Looking longer term, there is the potential for increased overseas sales of rail products and services via GDS networks that extend to other countries.

Rail tickets may be issued to the travelling public from a variety of different machines. Each machine has been designed to serve a specific purpose, whether it be for train operator staff in ticket offices, by travel agents or via self-service consumer activated machines. Here is a description of the main types of point-of-sale systems used within each part of the rail distribution network:

- **Stations** Ticket offices in stations use an all purpose ticket issuing system (APTIS) to issue tickets and record sales transactions. APTIS has been used successfully by British Rail ticket offices since 1986. The machine is a purpose

built piece of hardware and can only be used for issuing rail tickets. It also requires two separate power sockets and an on-line communications capability. The communications facilities needed are a British Telecom Rapide socket and an approved modem, which are required so that tariff data can be downloaded from the British Rail main-frame and ticket sales can be uploaded overnight. One of the few problems nowadays with APTIS is that few rail stations have devices that are capable of processing the bubble memories used in the original machines (bubble memory is a rather outdated storage technology).

Although it is possible for APTIS to be used by travel agents, they need to generate a high volume of rail business to justify it economically. This is because the machine must be leased on an annual basis and is quite costly (about £4,000 in the first year alone). A general guideline is that an agency needs to have British Rail ticket sales of at least £0.5 million per year in order to justify an APTIS machine. It is for this reason that only the largest of the multiple travel agency branches use APTIS machines. Often such branches house a central rail ticket issuing operation that services several regional branches (or even all UK branches). In total, there are currently 2,500 APTIS machines installed in the UK.

In the future, SEMA will be enhancing the software that runs on the APTIS hardware. The hardware is extremely robust, reliable and has a keyboard designed exclusively for rail ticket sales. This hardware can therefore be used as a firm base to develop on-line links to the main-frame timetable and fares data bases and also to card authorization systems.

- **Trains** Ticket inspectors on trains use the Super portable ticket issuing system (SPORTIS) to issue tickets and record sales transactions. SPORTIS is a portable ticket issuing machine used by roving ticket inspectors on trains, at departure gates and smaller stations. It is less sophisticated than APTIS and stores fewer fares and ticket details. Data are exchanged with SPORTIS by removing the memory and inserting the removed cartridge into a special device. This device reads the stored data on the tickets issued and writes updated tariff data into the memory. The memory is then re-inserted into the SPORTIS machine. There are 3,000 SPORTIS machines currently in use throughout the UK at present.

  The software that supports SPORTIS will be used as a base on which to enhance the system further in the future. A new hardware platform is to be developed with a capability to produce magnetically encoded card-sized tickets for use on the underground. The challenge for this development is to find batteries that are powerful enough to drive the encoding technology, which is rather power hungry.
- **Telesales centres** Telesales centres and other retail servicing points use the Tribute system to provide information support for incoming telephone calls from customers. Tribute is a software product that runs on a PC. The PC uses telecommunications technologies to communicate with the main-frame computers for fares, timetable and reservations support. The main user is the National Rail Enquiry Service (NRES), which was set up at the direction of the UK's rail regulator. This is a telephone service centre that receives calls from customers and is accessible via an (0345) local call number from anywhere in the UK. In total, there are 700 Tribute systems installed in the UK. The major features of Tribute are:
  - *Full function rail system* Tribute is used for a wide variety of functions related to the sale of rail tickets. Although the focus of the system is on the InterCity and Eurostar services, all UK train services are supported. The principal functions are ticketing, quick issuing and balances.
  - *Ticketing* When all information has been entered the user may request an ATB ticket to be printed with an encoded magnetic strip on the back. Cancellation of tickets can then easily be processed because the ticket to be cancelled is simply inserted into the ATB printer, which reads the ticket details encoded on it and automatically displays a cancellation screen for further processing. Credit card charge forms may also be printed automatically.