Hotel technology and reservation systems

Challenges facing the lodging industry

The hotel industry is currently the most underautomated sector of the international travel industry. In comparison to the airlines, its reservation systems are often archaic and a high proportion of bookings are still received at individual properties direct by telephone or telex. This relative underautomation prevents the collection of consumer profile data essential to developing effective marketing strategies, and the development of adequate yield management. A number of chains – notably Hilton and Sheraton – are now investing in improving their reservation systems. The airline CRS vendors are also looking to establish joint programmes with hotels. So far the chains have been reluctant to participate. However, Covia's incorporation of Hilton International and likely expansion by Murdoch of Utell and a related videotext system is likely to encourage them.

Hotel automation in transition

The lodging industry collectively is the most underautomated segment of the international travel industry. Reservations are often still dealt with by hand, and many of the automated reservation systems that do exist are so archaic or non-compatible that inaccurate bookings, dissatisfied customers, poor inventory records and yield management are the norm. To a large extent this is now being recognised and hotel reservation systems and property management automation are currently undergoing a transition in the USA as both the industry and the consumer demand more accurate and wider data availability. Several major hotel reservation vendors, such as Hilton and Sheraton, have extensive modernisation programmes under way, and a number of the larger airline CRS suppliers are proposing joint reservation schemes with major chains.

Nevertheless, while these developments look like improving hotel automation standards and capabilities, hotel reservation systems are still markedly inferior to the travel industry's principal information suppliers – the airline computer reservation systems (CRS) – and most developments as currently proposed are unlikely to meet hotel companies' international needs for more accurate and sophisticated reservation management and database control.

Marketing challenges must be met

This lack of automation represents a serious point of weakness concerning competition both between hotel chains and between the hotel industry as a whole and the major airline-based CRS vendors of Apollo and Sabre. Just as has happened in the airline industry, access to, and interpretation of, data will be critical in helping hotel chains address the marketing challenges they now face. Hotel systems' architectures and management techniques need to change radically if true marketing independence is to be enjoyed long term by most large chains. The report discusses the current state of hotel automation and the systems

The author, David Wardell, is vice president of technical services for travel management consultants Corves Consulting, based in Maryland, USA, and a specialist on travel industry automation

challenges currently faced by hotel companies, with particular emphasis upon the larger US national and international chains.

CURRENT HOTEL RESERVATION SYSTEMS

Holiday Inns largest reservation system

The largest hotel reservation network in the world is owned by Holiday Inns. The Holidex system services Residence Inns, Embassy Suites and Hampton Inns, in addition to Holiday Inns. Future expansion is planned to include support for Harrah's Resorts. The Holiday Corporation has invested heavily not only in central systems hardware and software but also in related areas such as communications network development. Holiday Inns believes that its partitioning and hosted processing abilities are superior to any existing system, based upon its current ability to support several competing chains, and regards its system position as secure over the long term.

Hilton jointly owns its computer reservation centre, Compass Computer, with Budget Car Rental, with both vendors operating in separate parts of the same system. Although among the first hotel central reservation projects, Hiltron has been enhanced consistently over the years and is today among the most functionally rich and successful of systems. Some months ago Hilton began a major software update to modernise thoroughly its existing system and introduce current database management techniques that will support the needs of the two owners for the foreseeable future.

System enhancement

Marriott's Marsha system employs several advanced reservation techniques, such as online property access to the central database, that are not found elsewhere. Marriott is planning to expand further the capabilities of the system, particularly in such areas as Management Information Systems (MIS) and statistical reporting, through an enhancement programme that is yet to be fully announced. Sheraton's Reservatron III system, the most recent variant of one of the industry's oldest reservation processing facilities, is currently undergoing extensive modernisation in connection with Sheraton's well known Reservatron IV project. When complete, Reservatron IV will link individual property management systems to a central data processing facility using advanced technologies.

To serve independent hotels and small chains, a number of hotel reservation systems have been developed in recent years, the largest of which is Utell. The company was recently acquired by Murdoch Publishing (publishers of the *Hotel and Travel Index*), and in connection with its new owners has developed a system specification for an advanced hotel information and reservation processing system that will integrate agency based sales with property specific video displays. Although existing today only in concept and prototype, the Utell system is the most advanced reservation system on offer by a major vendor.

UNDERSTANDING HOTEL AUTOMATION

Comparison with airline CRS

In principle, hotel automation systems, like airline CRS, accept and manage reservations. The international travel industry tends to view reservations as a condition or process that operates fundamentally the same throughout all areas of the industry. This is not so: airline CRS are greatly superior in concept to most hotel reservation systems. Although the latter were often later in developing than airline CRS, the amount of investment in most of their systems has been tiny. In comparison, management have tended to place little emphasis on them, and a number of the concepts underlying them are archaic.

A comparison of hotel systems with airline CRS is interesting. Airline CRS users (mostly travel agents) access inventory in what is described generally as an online, real-time environment. Under such conditions, when seats are reserved, inventory is decremented and the same space cannot be sold to another system user unless there is a cancellation. Airline inventory is defined as seats available to be sold on any particular flight segment, as determined by the actual number of seats onboard the aircraft together with inventory management adjustments – upward or downward – that compensate for anticipated conditions such as necessary overbookings due to no-shows on a particular route. When reservations are requested for the CRS vendor or user host, inventory is instantaneously decreased by the required number of seats.

The sell/no sell environment

Offline carriers – those with their own inventory systems that are not part of a CRS host – operate in a sell/no-sell environment. The CRS user may "sell" up to four offline seats in any one transaction. The sell message is transmitted to the computer system where the inventory is managed, and appears in that system in the same way as do reservations made directly in it. When a mathematically predetermined point is reached, and one that differs between flights and time periods, a no-sell condition is created and inventory is closed in the offline CRS system. No further sell messages are accepted from offline systems.

The airline manages no-sell messages to other carriers so as to permit as many bookings as possible, but not so many that the inventory management parameters for that flight are violated – in other words, to limit the possibility that the time lag between the instant a CRS generated sell message is created and the instant that message enters the reservation system where inventory for that flight is stored might cause too many seats to be sold. Because inventory is usually closed to further sales from other systems prior to the point where all available seats are actually sold, there are some variances between systems.

Airline and hotel inventories contrasted

	Airline inventory characteristics		Hotel inventory characteristics
1	Although there are divergent paths to access inventory, depending upon the particular CRS employed, inventory is centrally managed and resides in a single host processor to which all other booking points must look.	1	Inventory is stored in numerous locations specific to each property in the hotel network and may be accessed through any of several different paths by any given customer or booking system.
2	That central processor is the final arbiter or manager of inventory – no more than one system retains or manages inventory for the vendor.	2	There is no true arbiter of hotel inventory on a system-wide basis. Insofar as one exists, it is specific to each property in the chain or system.
3	The variances between on and offline systems, with respect to inventory access, are issues of timing only, in that all reservations, once received, are treated equally.	3	The closer one moves to the source of reservation activity, the more accurate the reservation becomes. Therefore, contacting the individual property directly produces the most accurate result.
4	Programmatic decisions as to the availability of inventory are tied to the actual number of passengers that can be accommodated on any given flight.	4	Decisions as to the availability of inventory only tenuously reflect the actual number of available rooms. Rather they depend on the booking channel employed, the maintenance of that channel, its proximity to the actual property, and the accuracy with which the individual property manager is able to predict occupancy and demand from day to day.

Hotel reservation system concepts

In contrast to airline CRS, hotel inventory and reservations can be managed by two (sometimes more) systems: a central reservation processor (possibly with subservient local reservation systems) and a property management system (PMS) specific to one hotel (which may or may not be manual). In most large hotel networks, the central system functions simply as a message switch to route customer reservation requests which might have come through either a hotel telephone reservation centre or an airline CRS or from individual properties in the chain. Strictly speaking it does not act as a repository for inventory. This is maintained, rather than at one central point, throughout the numerous properties in the hotel network and can, therefore, be interpreted differently at each point.

In contrast, property management systems are specific to individual hotels. They differ greatly from each other both in basic architecture and in functionality, and there is little or no design coordination between competing products. Essentially they provide both a reservation and a billing system for the hotel, possibly with other accounting and MIS features depending upon the particular design employed. It is relatively rare to find a PMS interfaced or directly connected to a hotel chain's central reservation processor, although this is not unknown and a number of hotel chains, such as Sheraton, are now trying to do this.

Use of regional centres

In stark contrast to airline CRS, which are routed directly to the central host through the ARINC or SITA networks, many hotel chains use regional reservation centres at locations distant from the central host. This is particularly the case where the host is located in the USA and regional centres handle reservation traffic originating in Europe, the Pacific or South America. Sheraton, for example, uses this system extensively, for both cost and efficiency reasons. These smaller reservation centres coordinate inventory requests for properties within their respective regions, thereby lessening overall international telecommunications costs and reducing the processing burden on the host.

HANDLING HOTEL RESERVATIONS

Four main reservation channels

The process by which hotel reservations can be made are numerous but, broadly, they can come directly into the individual property, from a regional centre, the chain's central system or via airline CRS. The proportion of hotel reservations actually handled by the chains' reservation centres is low. In the cases where it is used, a reservationist responds to the customer's queries based upon information displayed on a computer terminal. Rooms available for sale usually comprise several categories and seasonal rate periods applicable to individual properties. Normally the number of rooms is not displayed, as the central system operates on a sell/no-sell basis. All rooms are indicated as available for sale in the system and may be reserved until a predetermined (and mostly arbitrary) cut-off point is reached. Thereafter, no-sell messages, applicable to specific room types and dates, are generated by the property and passed to the central system, thus closing available dates and rates from display.

For most large hotel networks, "availability" is determined purely by the individual property, where it may be maintained using a PMS, or even held manually. When the property's reservation centre establishes that no more space should be made available to central reservations, which may be influenced by factors apart from the actual number of individual reservations held (such as anticipated local demand), a no-sell condition is created.

Many hotel reservation systems are large and relatively powerful computers, such as Sheraton's IBM 4300 series and Hilton's IBM 3080 series. However, this is

largely because they must support hundreds of reservation terminals, each conceivably with concurrent transactions in progress, as well as numerous simultaneous communications links, and not because they are managing a complex or huge inventory linked database, as with an airline type CRS.

Database hotel inventory systems

In certain large hotel systems, central inventory management is practised and reservations deplete available rooms as they are processed. Even in these systems, however, variances between PMS-level inventory and the central system continue to exist. This is because most large hotel chains are complex combinations of franchise, ownership and property management. Within just one hotel chain, properties may be wholly owned by the hotel corporation, owned by another company and managed by the hotel corporation under contract, or owned and managed by another company under a franchise relationship. This last system which accounts, for example, for the majority of the Sheraton network, permits the hotel corporation's name to be used and provides certain support functions (such as reservation, marketing and planning services) but without the hotel corporation actually being involved in daily management decisions or operations.

Examples of wholly owned hotel properties are rare, particularly amongst the US chains domestically or internationally. Equity participation among hotel management companies is growing but most networks are still a complicated mixture of whole/part ownership, management and franchise. Thus the hotel chain may provide central reservation management facilities but if it operates a diverse network where central corporate influence over management practices varies, it may be unable to enforce its universal use if a property prefers another locally oriented reservation centre or system.

Reservation transmission

When a reservation is processed, a message is transmitted to the property in question with information that the local guest information database should be updated. These messages are communicated using almost every conceivable type of transmission technology, often varying within the same hotel network depending upon the sophistication of the property's PMS, its physical distance from the central system and the reliability of communications media available to the property. While a PMS may be linked using real-time dedicated high speed data communications circuits, most properties receive batch transmissions periodically. These may be transmitted using technology no more advanced than teletype, or even cablegram, needing to be re-entered manually into the PMS upon receipt.

Hotels reservation requests received through airline CRS are similarly processed. Requests from travel agencies or other CRS users are offered information as to availability by the CRS hotel database. This "availability" is different from CRS availability (which is maintained exclusively on a sell/no-sell basis and separate from any hotel system database), and usually requires being updated by the central system – which is itself often maintained by individual properties – all with varying degrees of accuracy.

Hotel displays differ greatly concerning the range and quality of information, reliability of data transmission, and ease of use. Whereas a hotel database on an airline CRS might display five rates and room type categories, the hotel's own system may manage 15 or more, which means that the hotel management must determine which rate types will be displayed to the CRS user. These may or may not be compatible with the needs of the traveller. There is a further discrepancy between the information displayed on the airline CRS and that in the hotel database. When a no-sell or closed situation exists at the central hotel reservation system, the CRS display for that property is updated so that the closed room/rate type is no longer displayed. However, if cancellations ensue and the rate again becomes available, the CRS display is rarely opened again. Further, where inventory is closely controlled by the individual property, the hotel is unlikely to open up the reservation system display for the rate in question, preferring to accommodate local reservations or guests contacting the property directly instead.

Hotel central reservation processing

The CRS generates a standard airline type message to the central system, using principally the ARINC or SITA packet message networks, wherein reservations typically drop to a single queue or small group of queues thereby minimising the CRS's impact of conceivably hundreds of terminals generating simultaneous reservation requests. CRS based bookings, therefore, are generally less "data demanding" for the hotel vendor than are telephone queries.

After the CRS booking is received by the hotel reservation system, it may be processed in a number of different ways depending upon its composition and the nature of the computerised systems involved on each side of the transaction. Although the hotel would ideally prefer to have all CRS bookings processed automatically as they reach the top of the CRS queue, in practice this is never the case. Agent errors, omissions of required data, or basic incompatibility of the hotel system with the CRS create rejects which must then be handled manually by agents at the hotel's reservation centre.

A typical average reject rate for a large hotel system is 25-35 per cent of all CRS bookings. Generally rejects are experienced because of incomplete or incorrect data provided by the CRS booking agent. However, some CRS message systems are wholly incompatible with certain hotel systems, and can create as high as a 100 per cent reject rate.

Some computer programs designed to be sensitive to incorrectly formatted reservation information may cause particularly high reject rates (which may be corrected manually by the hotel's reservation centre or returned as unable to the CRS booking agent, depending upon chain policy), but at least they also protect customers by catching computer difficulties before they result in incorrect or cancelled reservations. Most of the hotel chains are working to correct this situation. Meanwhile a number of the chains with high reject rates are not encouraging agent bookings by this process, and specific properties may not even be included in the CRS at all.

HOTEL RESERVATION SYSTEMS: THE STATE OF THE ART

Many systems outdated

The lodging industry collectively represents the most under automated sector of the international travel industry. Not only are many operations supported manually, but existing systems and processes often use inferior or outmoded technology. This is true for both hardware and software as well as communications and data transmission.

Large multinational hotel systems, which are almost exclusively based upon large scale IBM mainframes, may employ hardware of comparatively recent vintage, such as IBM's 4300 processor series introduced in the early 1980s, although occasionally larger machines are used. Software for these systems, by comparison, often originated with "core" programs that date back 15-20 years (the architectural concepts supporting the system are frequently even older) and can be exceedingly primitive by contemporary standards.

The management of hotel inventory, particularly the amount of control individual property managers have over it, has not changed materially since the origins of centralised hotel systems in the 1960s and does not measure up to contemporary standards of yield management and database control found in other areas of the travel industry. These limitations, together with deficiencies in communications and automated processing, means that most hotel networks are not able to compete with the airline CRS vendor in installing systems in travel agencies. The dominant

position of CRS as an airline reservation system limits the hotel's ability to display the full range of its products and thus its ability to create joint marketing programmes with its distributors. Equally the limitations to hotel inventory management make it unclear what types of new and aggressive marketing relationships a hotel chain could actually deliver to its distributors in any case.

Existing systems contrasted

Airline reservation systems trace their beginnings back over 20 years, but evolved along significantly different lines than have most hotel systems. Most CRS software originated with IBM's Passenger Airline Reservation System (Pars – the generic software package offered by IBM during this period rather than the current CRS product of the same name, owned jointly by TWA and Northwest Orient Airlines). Some carriers, notably Air France, SAS, Iberia, Lufthansa and Northwest Orient, have adopted similar systems developed by Sperry Univac (now Unisys after its recent merger with the Burroughs Corporation).

Pars-type systems are "transaction oriented" in that they are specifically designed to handle a variety of interactive reservation requests involving frequent database queries, information entry, information retrieval, and information updating. The airline transaction system, Transaction Processing Facility (TPF), is "multiprogrammable", meaning that several high priority programs are time divided so as to permit sharing of the same machine resources while making the individual programs available to the system more or less simultaneously. Airline systems also divide specific tasks, or sets of related tasks, across multiple processors that coordinate their actions and responses.

Rapid access to information

While airline reservation systems are comparatively costly and difficult to maintain (with limited application to situations that are not purely transaction oriented), they succeed well in meeting user needs for rapid availability of information, generally within a few seconds, from a database containing millions of individual records and information files. Almost universally Pars/TPF-type programming environments dictate a larger, centrally managed, tightly controlled processor array, rather than true distributed processing techniques (ie where independent elements of the overall system are segmented to discrete processors, often at remote locations).

Hotel systems, although they involve numerous transactions, frequently employ less robust and flexible technology than that in use by airlines. One example is the Customer Information Control System (CICS), in use by some segments of the hotel industry, which is an interface method between a computer's general operating system and application programs developed principally by the user. CICS programs manage terminal interaction with a central processor database and permit efficient file management, but are not as dynamic at high transaction volume as TPF systems – although they are more flexible and employ generally more "mainstream" programming and development technologies.

Role of airline CRS

Several US CRS vendor companies, notably American Airlines' AMR Travel Services, United's Covia, and Texas Air's SystemOne, have expressed interest in providing technology and transaction processing services to the hotel industry (among others). All these CRS companies face substantial investments in current programming, development of new resources and in training programmes (necessary to preserve the pool of professionals to maintain a large airline system), and are now beginning to look to hotel automation as an opportunity to defray their own development costs. This they hope to do through fees charged for the development of system tools for hotel companies and for transaction processing in the systems where the CRS vendor retains an equity interest.

The emphasis some CRS vendors have placed upon improving hotel bookings reflects the central role played by CRS in large agencies. The larger the number of services on a system, the greater its attractiveness to agencies, and the higher the

transaction or booking fees accruing to the CRS vendor. In the last few years American Airlines has approached most major chains with proposals for joint development. Originally these proposals were based on a reservation bureau whereby the hotels would simply pay a user transaction fee. This was not received well by the hotel chains which were concerned that their products would not receive display sufficiently differentiated from their competitors to achieve increased bookings. The most recent proposals by American have involved joint equity stakes by the major chains with a minority stake owned by the airline. It is still not clear whether this will receive a more positive response.

THE MYTH OF THE AVAILABLE ROOM

Interpretation of "availability" concept varies

Few processes in the travel industry are as inexact as reserving a hotel room. Depending upon the method used to transmit the reservation request and the physical location of the person managing the transaction, as many as four interpretations of "availability" may affect a single room reservation.

Because of the confusion that this has caused in the past, some travel agencies now call directly to the hotel for verification of the reservation. Usually this practice is confined to VIP accounts or special circumstances, such as a last minute booking or a situation where a central reservations office cannot confirm space. Most agents have learned to check with the hotel anyway if a priority request is involved. Other agents compensate for an imagined or actual unreliability of most hotel booking systems by telephoning or telexing each hotel reservation direct to the property irrespective of circumstances surrounding the customer's request. This "service" is now considered so important that it is also used as a point of marketing differentiation between competing travel agencies.

Given the freedom that individual property managers enjoy in manipulating reservations to maximise yield and accommodate local operating conditions (most hotel systems believe the property manager must maintain this flexibility), it is difficult to arrive at a clear definition as to what actually constitutes an "available" room. Although reservations may be accepted through any or all of the channels described above, the circumstances under which the "reservation" will actually translate into a place for a traveller to sleep are based as much upon operational theory as upon perceived availability of rooms. This situation is more pronounced in the hotel industry than in the airline industry. In the latter, seats on airplanes are "overbooked" and capacity "projected" based upon experience. Whereas airlines reconcile reservations with capacity at flight time and start over with a new departure, a property manager of a large hotel often never knows precisely how many people are staying in the hotel (or how many rooms are truly "available") from one day to the next.

Alternative booking channels

This unreliability of dissimilar databases and booking channels has encouraged some airlines to experiment with alternative booking channels and methods, principally direct access and non-CRS protocols. Direct access was developed chiefly as a method of accessing offline airline databases by Eastern Airlines SystemOne Direct Access (Soda) CRS network. It permits real time "windowing" into participating carrier databases so that inventory may be "viewed" at its most reliable point rather than through display in an offline CRS which may be less accurate. Under the Soda direct access method, direct communications links are created between Soda and cooperating offline carriers using principally the Airline Line Control (ALC) terminal control and management protocol. The actual reservations are processed through Soda and not directly in the offline system – this differs from multi-access, where bookings may be initiated and maintained in numerous systems.

In a hotel environment, direct access has yet to be widely applied, although several companies, particularly Marriott and Hilton, have expressed interest in permitting travel agents to have this ability. Direct access would allow agents, through dedicated terminals, to display information directly from the hotel reservation systems, thus receiving hotel inventory direct and avoiding the CRS intermediary step altogether. However, since hotel reservation systems have developed along entirely different lines from Pars-based CRS, the technical complications associated with hotel direct access are great. For example, hotel system displays, although containing more rate and availability information than CRS displays, are generally cryptic to agency eyes and would require considerable training to be used effectively. If many hotel systems permitted direct access, all of which differ from one another, the problem would be compounded to such a degree – the travel agent having to learn so many systems – that hotel direct access would probably be a little used feature. Further, apart from booking related information, most hotel systems contain little ancillary information useful to a travel agent.

Direct access developments limited

These limitations could be avoided by the addition of extensive "translation" in the direct access step, ie an intermediate processing or formatting step to be inserted between the agent's CRS and the actual hotel database. Booking and information display commands could be structured to use sequences already familiar to the agent, and actual displays could be rearranged and supplemented so as to provide more accessible and useable information. However, currently there are no hotel direct access connections under development between the five US CRS vendors and any major hotel system that would overcome this problem. Apollo, with its overall competitive emphasis on enhanced technology, has made it clear that it is interested in this area, but the company has no development programme in place. Equally Delta's Datas II has not taken substantive steps towards non-air direct access technology while Pars has elected to pursue non-air direct access along more basic and traditional lines.

American's Sabre, through its "Total Access", offers a number of programs to hotel vendors that range from simple communications circuits between Sabre and the hotel processor (bypassing the ARINC/SITA links) to direct access-type booking environments that accomplish command and display translation using an array of Digital Equipment Vax processors as an interpretive front end to Sabre. These applications, however, are limited to the translation of existing hotel system commands and displays into ones more useable and familiar to travel agents, and do not tackle the information and structural limitations of the hotel system. Currently it is only Soda, with its emphasis on direct access technology, which has embarked on an ambitious development programme (in connection with the Arms transaction processor) that will enhance hotel booking capabilities when completed. SystemOne's Arms project differs in content and approach from that employed by the original Arms system.

Woodside's Arms system

Recognising hotel (and car) bookings as a prime area for agency competition and superior hotel booking services as a true value added feature for travellers, the US based Woodside international agency consortium undertook a non-CRS technology project that culminated in the introduction of the Advanced Reservation Management System (Arms) to Woodside member agencies in early 1985. Arms is a fast-track approach to achieving some of the benefits of direct access, or actual access to a hotel reservation system, without radically changing the normal booking practices of a successful travel agency. Although Arms operates in connection with the major CRS systems it is an independent message processor.

Today all Apollo and Sabre travel agents communicate through Arms. Connections to the SAS reservation network have recently been completed and they are imminent to British Airways, Pars and Soda. Transactions are also routed through numerous other CRS, although these are processed manually and employed only where automated links are impractical or not available. Currently thirteen hotel and car vendors participate in Arms, among them Hilton, Marriott,

Sheraton, Holiday Inns, Hertz, Avis, National and Budget. Arms allows the agent access to a larger variety of rates and inventory information (including those not normally offered through CRS) as well as offering proprietary Woodside member special rates.

As of January 1987, Arms and other aspects of Woodside's hotel transaction processing system and rate programme were acquired by Citicorp Information Management Services (CIMS), a unit of the same company that owns the multinational Citibank. The range of products and services, including Arms transaction processing, will be greatly expanded by Woodside, and will be made available to other agencies and agency groups internationally (although Woodside will maintain its specifically proprietary programmes, such as its own negotiated hotel rates, independent of other organisations. In the same way, other agency groups will use CIMS processing to support their own exclusive programmes.) Although CIMS, as the current provider of all Arms technology, participates directly in development of SystemOne's Arms project, the enhanced products to be made available to agencies generally will not be the same as the Soda project.

Arms provides service advantages

Arms provides an essential hotel booking service to travel agencies which otherwise are faced with time consuming manual hotel transactions. For example, agencies using Arms can even request services that cannot be booked through a vendor reservation system. These appear on an Arms queue where they are accessed by a reservationist who communicates directly with the property involved by telephone or telex. This is usually done where special accommodation is desired, such as suites which are rarely carried as inventory in a central system, or if a central reservation system shows the property to be unavailable (if the booking agency has elected to pay for this latter service). Confirmations are then routed back through the booking agent's CRS.

In this way the CIMS reservation centre automates the manual aspects of the hotel booking process which successful commercial travel agents consider essential customer services. This centralisation and systemisation of a highly manual process improves efficiency and reliability which even the larger travel agencies are unable to pay for and develop for themselves.

THE TRAVEL AGENT'S ROLE IN AUTOMATED RESERVATION SYSTEMS

Only 40% reservations through central system

Centralised reservation systems still only represent a minor portion of all reservations accepted by large hotel systems – approximately 40 per cent by the larger commercial systems – the remainder being processed directly by participating hotels. The travelling public is aware that hotel reservations can be made through various channels other than central sources (in contrast to airline reservations where there is no alternative), and the experienced traveller quickly learns that bypassing a central reservations system is often to his advantage.

Equally there are a number of disincentives to hotels routing transactions through a central reservations system. Often a hotel network must finance its marketing, central operations, and sometimes even general corporate profits through reservation transaction fees, which generally range between $3 and $7 per booking. Thus franchisees and hotels conforming to local profit targets are offered a financial incentive to circumvent the central reservations office. Also, accurate data collection on a chain wide basis is compromised when local hotels hesitate to record locally booked reservations in the central database.

These factors combine to make the agent's role operationally difficult. Whereas a vacation or leisure travel agency (constructing trips on demand to suit its customers' requirements) can often devote time to researching appropriate hotel properties, choosing the best and least expensive means of securing a reservation (which often includes writing letters), and assembling the components as part of a customer's itinerary, a business travel or commercial agency has neither the time nor the personnel to undertake lengthy research or use booking methods that do not result in rapid confirmations. The business traveller expects an accurate reservation almost upon demand, as most business trips are booked on relatively short notice. Moreover, business travellers expect a discount or at least a preferred rate even though their itineraries tend to be inflexible.

Corporate hotel programmes

Agents must employ new methods and booking techniques to meet these requirements since offering an excellent level of service is critical to the survival of all travel agencies. However, actual product differentiation is really the only competitive tool available to an agency that allows it to offer something its competitors do not. Specialised negotiations with hotels for preferred services provide the agency with one such distinct product.

Although some agents maintain hotel costs are not important to business travellers (assuming the business traveller will stay wherever is convenient and rationalise the cost as an uncontrollable item), market studies by Woodside, Runzheimer and others show this to be incorrect. Sensitivity to hotel costs is, in large measure, a function of marketing. As soon as a competitor presents a lower cost alternative to standard rack rate hotel costs, the business traveller (or at least the company travel controller) quickly adopts them.

Agency consortia, service groups and single large agency networks began to take advantage of offering competitive hotel rates and services some years ago. These rates are marketed to businesses exclusively through participating agencies. While the cost aspect is routinely emphasised, actual rates between programmes differ much less than is commonly believed. Rather the major points of differentiation tend to be:

- availability of preferred properties in major business centres (hotels frequently participate in only one programme);
- ability to deliver space at the lower rate when requested;
- ability to deliver the preferred rate upon arrival of the traveller, even where the reservation is not secured.

Operational implications

To secure rapid, confirmed reservations for its clients, a business travel agency often has to deal with its hotel requests separately from other bookings, usually in the form of a hotel desk that collects hotel requests from all reservationists and confirms them in the manner most efficient for individual hotels. The hotel desk generally uses all confirmation methods, from telex and written letters to telephone and CRS. Not all agencies have a "hotel desk" as such. Part of the Arms processing aim is to eliminate the hotel desk and centralise many of the various booking channels in a single system and manual processing centre. Also the largest travel agencies occasionally have actual reservation terminals supplied by the hotel chains themselves. Holiday Inns, in particular, has been particularly aggressive in placing its equipment with agencies.

Although hotel reservations form an important part of agency specialisation and customer services, dedication of agency staff to hotel reservation processing is expensive and labour intensive. Extra costs can only be offset by increased commission generated by more hotel reservations. Most agency revenue is derived through air ticket commission. On average less than one third of all travellers who stay in hotels make reservations through agencies, whereas the percentage of travellers using agents for air tickets is much greater. This indicates that it should be possible for the agency to generate incremental revenue from hotel bookings from their existing airline customers.

Collecting commission

Commission collection is another matter. It has been estimated that up to 50 per cent of all hotel commissions actually due are never collected by the booking agency. While automated agency accounting systems that contain hotel commission tracking systems exist, these are expensive to maintain, not wholly accurate, and still do not guarantee payment of commissions even where amounts due can be identified. No satisfactory method has yet been developed to address fully the agency's hotel commission problem.

Some hotel chains have adopted centralised commission payment systems, where responsibility for payment is removed from the individual property and placed with a central system management. The first chain to do this was Holiday Inns. Commission tracking for the hotel depends upon an efficient centralised reservation network that is used for all (or most) of the agency's reservations. Despite this situation, there has been no concerted movement among agencies either towards systems offering centralised commissions or generally away from those understood to be more unreliable, which is probably a reflection of the low priority accorded to hotel reservations by most agencies.

HOTEL RESERVATION SYSTEMS AND AIRLINE CRS

The anonymous customer

One main reason for hotels developing their technology and reservation systems is the need to tackle the problem of customer "anonymity". Often, a hotel company has no idea who its customers are or what is ultimately motivating them to use the company's services. The reservation system, because of its historical limitations, cannot generate useable information about customer purchasing patterns and motivations and the customer remains simply a name and telephone number. Various avenues are open to hotel chains in improving their reservation systems.

Airline CRS is underutilised as a hotel booking tool. This is largely a result of the inadequacies of all CRS hotel packages as well as the limited number of hotel reservations transacted by agencies generally – only about one third of the total. Yet agency distribution represents significant potential to hotel reservation systems – one that may be effectively exploited through systems enhancements together with targeted marketing programmes. As already mentioned, the major CRS vendors, American Airlines in particular, have attempted to sell system proposals to the major hotel companies. The need for systems enhancement and the proven development capability of the CRS vendors has stirred interest among many of the major hotel chains.

Joint ventures brings dangers

However, not all these proposed joint technological developments are to the advantage of the hotel chain. Firstly the management and operational structures proposed by some of these joint ventures are best described as limiting since they seek artificially to ensure data independence and integrity at the expense of operational, management, development and, to a certain degree, marketing control. No matter how the technology company may be organised, the company in control of the development resource controls the project. This means a hotel company must surrender its data and, to a certain degree, its marketing independence to the controlling CRS vendor.

Yet few of the hotel chains appear aware of this danger, largely because they do not truly appreciate the value of technology and the possibilities of adapting it to suit their specific marketing needs. If there is a single lesson to be learned from the experience of CRS-based distribution in the USA it is that those companies

controlling the technology are able to manage the data to their own benefit and dominate agency based distribution and, ultimately, sales. Since reservation systems are geared to provide access to, or control of, data that are more sophisticated, accurate, or complete than those available to a competitor, then a marketing advantage can be achieved.

Airline CRS a Trojan Horse

Thus, while cooperation with CRS vendors brings development and operational efficiencies, as well as capital and technical resources, it also can minimise the hotel's ability to control its data and formatting to such a degree that major marketing opportunities – apart from data independence, which is an arguable benefit – are lost. This "Trojan Horse" benefits the CRS vendor by giving it access to a transaction pool from which fees can be derived. It also gives it access to reliable transaction data (even if individual customers and purchasing patterns are protected through some security scheme). At the same time it can potentially deprive participating hotels of product and distribution differentiation, and further contributing to their "commoditisation"

Yet, at the same time, CRS screen control is the single most important competitive differentiation available to a hotel chain in a CRS based agency environment. A joint system would mean that all properties are represented at the same level and differentiation becomes impossible. The property may benefit from "backend" management of inventory, yield, or availability practices in a proprietary fashion, but these are not important to the agent or other CRS user who will simply book what is shown on the screen.

Hotel chains looking at CRS based systems alternatives should be aware that their marketing and data objectives differ significantly from those of the CRS vendor. Whereas the hotel chain strives for "uniqueness" and retention or proprietary data management practices (which are exceedingly difficult for many competitors to duplicate), the latter desires, first, as little differentiation as possible so that economies of scale may be achieved, and second as great a participation as possible so that revenues from transaction processing may be maximised.

MARKETING IMPLICATIONS OF HOTEL AUTOMATION

Need to recognise importance of systems data

The collection of data useful to hotel chains has historically been limited by unsophisticated systems management and technology. Some major hotel system improvements (under way by Hilton and Sheraton in particular among the international chains) will to some degree relieve these deficiencies. But to a large extent data access will improve only as chain management recognises the central role that reservation systems data can play in an effective marketing programme.

As discussed in the March 1987 issue of *Travel & Tourism Analyst*, a number of the large chains, particularly Holiday Inns, Marriott, Sheraton and, recently, Hilton have recognised the advantages of a frequent stayer programme. These have been seen not only as customer loyalty tools (which in fact are increasingly running foul of central travel purchasing management in the majority of large US corporations), but also as a means of generating a database that could provide invaluable customer information.

Frequent stayer programmes

Frequent stayer programme data should reveal direct information as to customer travel patterns (related specifically to the hotel chain), airline and car rental preferences (assuming these suppliers participate in the hotel's programme), customer income and demographic statistics, corporate spending patterns, use of

travel agency or other booking services, and frequent user programme preferences. Indirectly, information may be gathered concerning hotel property deficiencies, individual traveller flexibility, customer sensitivity to prices, destination preferences (through analysis of claimed awards), ability of the hotel to generate incremental business among its frequent customers, success or failure of competitive marketing programmes, success or failure of airline marketing programmes (useful in identification of potential market partners), the early success of new properties or ventures, and reactions to the introduction of new amenities or services by the hotel or whole chain.

From this information overall trends can be identified that are essential to informed strategic planning such as: overall customer trends compared with the most frequent users, system wide customer profile patterns, identification of booking sources (corporate, individual or agency), trends in seasonality and other cyclical factors, success or failure of direct agency or corporate discounting, overall effect of yield or inventory management practices upon occupancy rates, and customer profiles (demographic and booking related) for individual cities and hotel properties.

Future automation strategies

Many of the frequent stayer programmes are still at an embryonic stage and are far from providing this sort of information. However, with proper investment and management, many should be able to do so. Working within a five year frame, hotels face the following strategic imperatives in improving their data management techniques.

1. Corporate sophistication. Policies and programmes must be implemented effectively to create, track, administer, and manage direct corporate discount and corporate hotel relationships. Within the next two to three years, US and international corporations will increasingly insist upon having their own independent booking systems in agencies (and on other reservation services which may not come through agencies). The hotel systems must have the capability to determine where their negotiating positions are and to what degree they may compromise and still remain profitable.

2. CRS domination. Hotel chains must maintain independence from CRS domination on several levels. First, they must free themselves of the technologically inferior positions occupied by most hotel reservation networks so that management can properly be proactive rather than reactive to events and be flexible to take actions specific to individual hotel companies (and not to the industry as a whole). Second, they must resist standardisation by CRS vendors that compromise individual uniqueness and force hotel companies to compete on the same systems level.

3. Alternative delivery systems. Hotels should not focus their distribution exclusively on agency or CRS channels. New reference technologies, such as interactive videotext/reservation systems, will grow in coming years as will hotel chain reservation systems placed in major corporate users and connected to public data access networks. The hotel chain must maintain the flexibility to exploit these technologies and programs independent of the priorities of an airline-based CRS vendor or its competitors.

4. Yield management. The more progressive hotel systems are today developing yield management software at a cost of several million dollars. This is critical to understanding purchasing dynamics and dealing with eventual direct corporate negotiations, as well as to improving agency discount deals. Within a few months, yield management for the first time will become a reality for a number of hotel chains and will provide a great cost and pricing advantage for them over principally smaller, independent or less sophisticated hotels.

New systems being proposed

Hotel automation and reservation systems are currently faced with great change. Several hotel chains are likely to decide on airline CRS systems proposals within the next few months. American is pursuing hard the concept of a joint development and before the close of 1987 perhaps four or five hotel organisations will enter into joint CRS technology partnerships (although full development of a functioning common system is three to four years in the future). Joint systems developments will be attractive to a number of smaller chains, but these will also be the ones which could compromise their "uniqueness" through CRS participation.

Meanwhile a number of other changes are taking place as Covia incorporates UAL's recently acquired Hilton International into its system. Holiday Inns has also indicated that it would be prepared to link up with other chains since its relatively sophisticated reservation system offers excess capacity. The other unknown is what developments are planned for Utell, and a new videotext reservation system under development by Murdoch.