

## The Role of Global Computer Reservation Systems in the Travel Industry Today and in the Future

One of the few examples for the global realization of electronic market coordination are the Computer Reservation System (CRS) or Global Distribution Systems (GDS) used in the travel industry. Because of the ever increasing competition, new technologies and changed distribution channels, a discussion has started about the role of CRSs.

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Before going into detail about current criticism and the systems' future role, we will briefly describe what CRSs are all about:

Ideally, CRSs are systems for purely (information transfer) logistical functions. They store current information about all available service providers and have the necessary infrastructure to transfer such data. This means that the systems also perform additional tasks related to service distribution, which in the area of goods are typically carried out by freight forwarders. They support the transport of goods (or the right to a service) by eliminating the physical distance between the producer and the sales mediator or the consumer respectively. Therefore, CRSs can be characterized as supporting distribution process since the current systems do in no way support negotiations between the producer and the consumer. CRSs are a combination of infrastructure measures offered to interested providers in the tourist industry. Similar to an empty supermarket, the system provides a sales area in the form of memory and communications media. The providers can then fill the empty shelves by providing their data to the CRS.

### Today's Competing CRSs

The development of such systems was already started at the beginning of the sixties, the objective being at the time to automate seat reservations procedures of airlines. Today, the largest civil data centers and the most powerful communications networks are being used exclusively for this purpose. After several

changes in the marketplace, the best known global CRSs are AMADEUS, GALILEO, SABRE, and WORLDSPAN with AMADEUS being the only one which is largely owned by European airlines. Together with GALILEO, it is the leading system in the European market. GALILEO, however, also has a strong position in the US market after it merged with an American system. SABRE and WORLDSPAN have been developed in the US. So far, SABRE is the only CRS which is wholly owned by one single airline.

### Functionality of Global CRSs

Using the global CRSs, travel agencies can make reservations directly from their terminal with any airline and on all continents without having to go through a coordination process or contract negotiations. All global CRSs provide the basic functions for the reservation process such as product presentation, reservation, fare quote & ticketing and additional services.

#### ◆ Product Presentation:

For a CRS, the most important source of information is the presentation of the products and services offered by providers in all areas related to the travel industry. Each group of service providers has individual screen categories the contents of which particularly represent the complexity of their offerings and specific features of their services. The product "flight" for example does not require complex descriptions since it is sufficient for a neutral product presentation to state the departure and arrival times, the route,

	AMADEUS	GALILEO	SABRE	WORLDSPAN
USA/ Mexico/ Canada	U: 7.839 T: 29.313	U: 13.347 T: 59.980	U: 17.496 T: 82.441	U: 9.200 T: 41.106
Europe/ Russia	U: 21.729 T: 59.804	U: 12.561 T: 39.487	U: 4.028 T: 11.477	U: 5.474 T: 10.208
Latin America/ Caribbean	U: 4.631 T: 8.247	U: 1.100 T: 1.918	U: 1.985 T: 6.328	U: 53 T: 268
Far East/ Australia	U: 920 T: 2.034	U: 3.686 T: 12.871	U: 4.113 T: 14.246	U: 0 T: 0
Africa/ Middle East	U: 374 T: 768	U: 1.632 T: 5.144	U: 490 T: 1.452	U: 600 T: 1.368
Total:	U: 35.493 T: 100.166	U: 32.326 T: 119.400	U: 28.112 T: 117.914	U: 15.327 T: 47.950

Figure 1  
Comparison between the number of users (U) and the number of terminals (T) of global systems (as at the beginning of 1996)

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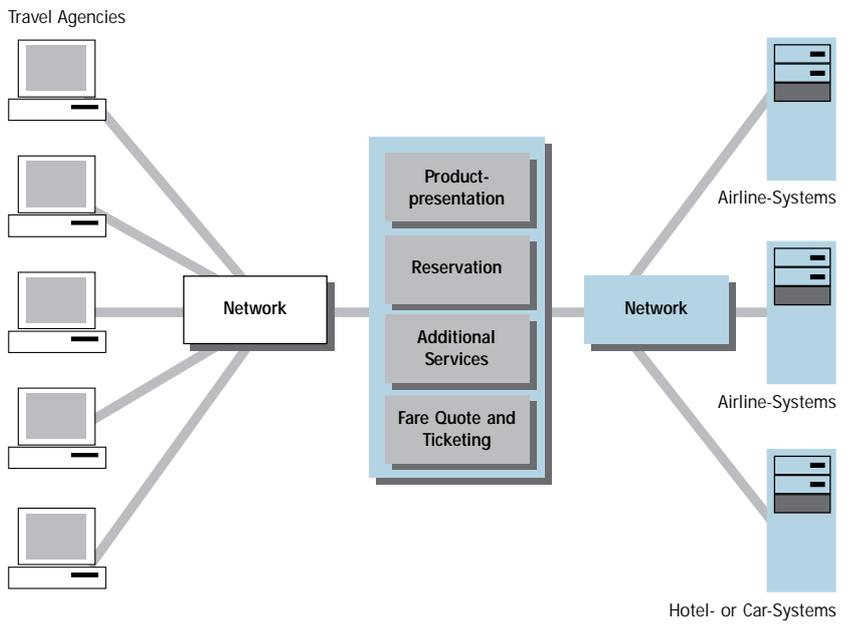


Figure 2  
Principel structure of CRSs

availability of particular reservation categories and possibly the fare. It may, however, be difficult to describe the products of other service providers appropriately with only a limited amount of information. Hotels, for example, have so far only been able to provide information about the price, the size of the bed and its approximate location which alone is not a meaningful description for potential customers. For this reason, it is intended to link the particular offers to visual multimedia technology to be able to provide more detailed information to the customer.

- ◆ **Reservation:**  
The core function of reservation systems and the main reason for developing them is the reservation of offered services in the travel industry. To this end, a so called Passenger Name Record (PNR) or Guest Name Record (GNR) is created for each passenger or each group of passengers. These records contain all services-related customer information. At the same time, this information is transferred to the internal inventory system of all service provid-

ers who thus have the latest information about availability at any point in time and can use it as a basis for a new offer. In addition, the system can also store customer related information such as e.g. all services provided to a certain customer, type of payment, service information etc.

- ◆ **Fare Quote & Ticketing:**  
Just like the product presentation, the fare quote, ticketing and voucher generating process depend on the type and the complexity of the services offered. For flights, multiple fares are being offered which differ according to the reservation category, the date of the journey, the day when the reservation was made, the route and the length of the stay. That means that practically each fare needs to be calculated individually. In addition, fare quotes can change daily. The prices of other service providers, however, are relatively fixed so that in most cases, they stay an unchanged part of the offer. For the ticketing, travel agencies receive a fixed number of ticket forms which may only be used after confirmation has been

received from the respective service provider. Typically, the print-out of any additional information material is not supported by most systems as it is not always necessary, like for example a print-out of a hotel or rental car reservation.

- ◆ **Additional Services:**  
Because of the increasing competition in the market, system operators were forced to offer not only the three essential components of an information and booking system but also additional services. Today, the user has direct access to essential travel information and can find further information in all CRSs about trade shows, visa regulations, particular events etc. Furthermore, programs and interfaces have been developed which facilitate the internal administration for each travel agent. Also invoicing, accounting, customer and quota management increasingly depend on the respective CRS. User prompting has significantly improved so that even inexperienced users can easily learn how to work with the reservation procedure. Since more and more PCs are being used in this area modern user interfaces have been introduced.

### The Information Infrastructure

Apart from the four core functionalities, a high speed network is the second basis of a CRS. It connects the system with the service providers on the one hand and the travel agents on the other. In Europe, travel agents are mainly linked via interfaces to the cooperating national systems in which case the local network infrastructure is being used. Travel agents using the CRS AMADEUS are linked via various networks. In most cases, they are integrated in the national START network. In other countries, they are linked either via the SITA network or via Datex-P X.25. The city and airport offices of airlines are mostly integrated in their respective internal network.

The network of the global CRS AMADEUS has additional 14 network nodes distrib-

uted throughout the whole world. They are connected to each other by 13 lines with 1.92 Mbyte/s and 11 lines with a lower transmission rate. These lines are utilized 60% at most. By automatically establishing alternative links, an availability of 99.7% is achieved since, in case of necessity, any message can be transferred via other nodes.

### Criticism About CRSs

Recently, there have been controversial discussions about CRSs. They have been called inflexible dinosaurs not being able to fulfill current or future market needs. Criticism mainly relates to the insufficient scope of services offered and the high distribution costs.

With most airlines it is possible today to book a flight easily and without problems merely by pressing the respective keys on the computer keyboard. However, there are still numerous needs for services which the current CRSs cannot yet fulfill sufficiently. With regard to product presentation, the offers are almost exclusively limited to the category of airlines. Other service providers (such as hotels, rental cars, tour operators, charter airlines etc.) only have a very limited reservation rate or are not displayed at all. In Europe, such tasks are mainly performed by national distribution systems. However, even today it is still easier to book a flight to a far off holiday resort than simply reserve a room in a small hotel nearby.

While the functionality "reservation" is working without problems on the basis of modern access technology "fare quoting" is still a complicated, incomprehensible, and confusing process. Price transparency or even price negotiations are not supported by the systems. Therefore, it always requires a lot of time to find the best fare. One of the reasons for these shortcomings is that the CRSs are owned by airlines who are not interested in making their products comparable. Most recently however, travel agents have increasingly demanded "Best Buy"-functionalities and information about negotiated fares.

Another weak point in the CRSs have always been additional functions since such functions would not increase the number of sold flight tickets. Only now modern graphical user interfaces are being developed in the various systems for the front office. Sufficient back office functions have been offered only very rarely.

Apart from the criticism about the internal capacities of the systems, one further point of discontent have been high distribution costs. Airlines have an enormous

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need for streamlining their organization in order to stay competitive. In many sub-areas, some optimization and efficiency measures have already been taken. Now the only costs which can still be changed and reduced are personnel and fuel costs as well as costs for sales. Generally, sales costs within this industry amount to 20 - 25% of the total revenue which is perceived as far too high. So it is the commission for travel agents and reservation fees paid to the CRSs which are now being checked and reviewed very closely.

### Reducing Distribution Costs

There are two approaches which can help to reduce distribution costs. On the one hand, the on-line services provide additional possibilities of cost-effective direct distribution to the end customer. Many airlines now offer access to their internal service provider systems via on-line services and in particular via Internet. This also helps reducing costs incurred by travel agents and fees to the CRSs. One of the industry leaders in this area is Lufthansa: Its interesting concept "Info Flyway" will provide statistical information on CD-Rom and will make it possible to make direct reservations via an on-line interface. Moreover, some airlines now offer last minute tickets at particularly good prices in auctions via Internet.

By using on-line services it will be possible to reduce costs for travel agent commissions and CRS fees and increase the load factor at the same time. However, this will only attract a small part of the overall clientele since in Europe for example only 3% of the population at most have access to on-line services.

The so called "no frill carriers", one of them being Southwest Airlines, have taken this one step further. In all areas, they avoid unnecessary costs (service, change of bookings, meals, etc.) and merely offer basic services, i.e. to transport a passenger from A to B at the best possible price. They also do not use or offer via the CRSs any of the normal distribution channels but process all incoming bookings with

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the help of powerful internal Client/Server systems. As in the past, customers now go back to calling the airline directly and pay there and then with their credit card. This aggressive procedure has forced many other airlines to also make direct reservations and by-pass the CRSs. Some carriers, such as Swissair, have come to an agreement with major travel agent chains which then can make their reservations directly in the system of the respective airline. Some of the major travel agents like American Express offer the possibility to various airlines and hotels to dis-

play their services directly in the travel agents' internal systems. This could sufficiently substitute the scope of services provided by CRSs and the cost of communication between the service provider and the travel agent can be reduced. However, this would increasingly counteract the idea of creating a global electronic market.

### Conclusion

In short, it can be stated that on the one hand the global computer reservation systems have reached a significantly high

economic and technological level and travel agents would hardly be able to do their work without these tools. On the other hand, however, because of the high costs incurred many providers avoid using this consistent concept with its complicated functional requirements and worldwide networks. Therefore, the CRSs are now at a turning point. Either the systems adapt to the new market conditions or they will become an early example for the destruction of the worldwide electronic markets.

## Fact File: The Four Global Distribution Systems in the Travel and Tourism Industry

by Karsten Kärcher – University of Strathclyde, Glasgow

Background information on key electronic market systems (EMSs) in the global travel and tourism industry is presented in this fact file. The major travel and tourism EMSs portrayed are the four global distribution systems (GDSs) Amadeus, Galileo International, SABRE and Worldspan. The historical (or evolutionary) development of the technologies of the four GDSs is shown in Figure 1, indicating how the technology of one GDS was based on another. The Société Internationale de Télécommunications Aéronautiques (SITA) is also outlined, which supplied telecommunication services to several of the GDSs and other travel and tourism organisations.

however, SAS sold its share to the other three due to financial difficulties following the Gulf War, leaving Amadeus equally owned by the other three airlines. The Amadeus Central System was based on the software of the reservation system System One and located in Erding near München in Germany. The system became operational in 1991, integrating the four national reservation systems Esterel in France, Savia in Spain, Smart in Sweden

and START in Germany, which were predominantly controlled and (partly) owned by the original four partner airlines, respectively, as well as integrating a number of other national systems of further airlines. Amadeus operated on its own network Amanet, on various national networks and on the global SITA network, and, in 1994, claimed to have Europe's largest civilian database. Since Amadeus' foundation, the operation and marketing of the national Amadeus sub-systems have been conducted mainly by > 30 national marketing companies (NMCs) such as START Amadeus Vertrieb GmbH in Germany, and Amadeus Austria Marketing Ges.mbh in Austria, with SAS having also remained a national partner.

**Amadeus Global Travel  
Distribution S.A.**  
Madrid, Spain

**Amadeus**  
(Amadeus Central System  
and Amanet)

Amadeus Global Travel Distribution was formed in 1987, with each of the four European airlines Air France, Iberia, Lufthansa and SAS Scandinavian Airlines System owning equal shares. In 1991,

Figure 1  
Evolutionary Development  
of GDS Technology

