

## **BUILDING CUSTOMER VALUE IN THE HOSPITALITY INDUSTRY: TOWARDS THE DEFINITION OF A CUSTOMER-CENTRIC INFORMATION SYSTEM**

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Increasing occupancy rates and revenue by improving customer experience is the aim of modern hospitality organizations. To achieve these results, hotel managers need to have a deep knowledge of customers' needs, behavior, and preferences and be aware of the ways in which the services delivered create value for the customers and then stimulate their retention and loyalty. In this article a methodological framework to analyze the guest–hotel relationship and to profile hotel guests is discussed, focusing on the process of designing a customer information system and particularly the guest information matrix on which the system database will be built.

Key words: Hospitality; Customer loyalty; Customer relationship management;  
Customer information system; Guest information matrix

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### Introduction

The strategic use of technology in marketing is one of the most significant opportunities the hospitality industry has at this moment (Cline, 1999; Dev & Olsen, 2000).

The implementation of a targeted sales and marketing plan and the development of a customer relationship management (CRM) policy require a deep knowledge of customers' needs, behavior, and preferences, and new technologies are one of the major drivers of change in this context. Creating automated guest histories helps hotel managers to

define their customer mix, identify which benefits are salient for different segments, ensure that the hotel supply and capabilities match the guests' desires, and increase delivery efficiency. Enhanced customer satisfaction and retention lead to increased customer loyalty, occupancy rates, and revenue per available customer (Dubé & Renaghan, 1999a, 1999b).

Yet the collection and use of customer information are frequently intermittent, delayed, and fragmented (Cline, 1999). In some cases, especially in small and medium-sized hotels, data are still kept by hand and recorded on index cards or a simple

database of guests is built, which allows basic analyses to be carried out.

Even where an information and management system is implemented, very few hotel organizations have a formal customer-oriented e-business strategy. Most of them focus actions and research primarily on transaction-centric solutions, to improve the efficiency of internal operations and administrative procedures [property management systems (PMS)], the core being the delivery of the guest folio. In some cases, guest services are also enhanced, but this is an indirect added benefit and not a primary goal (Siguaw & Enz, 1999).

The setting up of a customer information system (CIS) that automates information search and processing and provides a consistent view of the customer across every point of interaction, bringing together a wide array of data into actionable formats that support management decisions, is the challenge for the future. The system, based on a data warehouse with an accessible and user-friendly interface, will integrate different operational systems and databases (PMS, Central Reservation System, etc.) and will be able to store multiple profiles for the same customer, depending on his/her behavior and nature of travel.

This article proposes a reference model to analyze and profile hotel guests, describing the methodology followed to define the guest information matrix (GIM) on which the user interface and the CIS database will be built. The research work represents the first step of a project that is being carried out in cooperation with a hotel technology provider, whose aim is to develop a guest relationship optimization solution for his clients.

After discussing the importance of managing customer value and the role information technology (IT) has in supporting customer knowledge (second section), in the third section a model to analyze the main aspects of the guest–hotel relationship is presented. An investigation of hotel managers' propensity to build an automated guest history is included in the fourth section. The definition of a guest information matrix that optimizes data collection and minimizes the hotel's investment costs is the subject of the fifth section. Concluding remarks and indications for future work are given in the last section.

## Promoting Customer Loyalty and Retention: From Traditional to Knowledge-Based Marketing

### *Customer Loyalty Versus Satisfaction*

As mentioned by Dubé and Renaghan (1999a), "managing customer value by creating quality and service that customers can see now is considered a critical component of companies' strategic marketing. Customer value is what builds loyalty" (p. 79). Orientation to customer retention, continual customer contact, and high commitment to meeting customer expectations are the new strategic rules of relationship marketing, which are based on factors other than pure economic assessment and product attributes (Bowen & Shoemaker, 1998).

Loyalty usually implies satisfaction, but satisfaction is not loyalty. In a hotel, a guest may be satisfied by his/her stay because the services purchased have met his/her expectations, but this does not imply that he/she will repeat the experience and/or recommend it to friends and relatives (Bowen & Shoemaker, 1998; Shoemaker & Lewis, 1999). Apart from transient travelers, who do not generally return to the area where the property is located, some people choose different hotels according to the purpose of trip (e.g., whether they travel on business or with their family), others look for novelty and like to sample different properties in the same area, others are price sensitive and shop for the best deal. Finally, some guests do not develop loyalty simply because they are not encouraged to return.

Although keeping guests satisfied is important, loyal customers bring more value than satisfied customers. They generally show a lower price sensitivity over time, tend to resist changing service providers, identify themselves with the brand, and maintain a strong preference for the service purchased against competitors (Butcher, Sparks, & O'Callaghan, 2001). This allows the hotel to reduce marketing costs and to significantly increase occupancy rate and profitability. According to research carried out in a group of service industries, a 5% growth in customer retention can result in a 25–125% growth in profits (Reichheld & Sasser, 1990).

To stimulate loyalty, hotel managers need to have a clear understanding of guests' value drivers and be aware of the ways in which their business contributes or fails to contribute to the creation of such value

(Dubé & Renaghan, 2000). These drivers may be different according to purpose of trip (e.g., leisure vs. business), kind of travel party (a single tourist vs. a family), culture (e.g., a Japanese vs. an European guest), sociodemographic characteristics, revenue, etc.

*Managing Customer Relationship and Value:  
Towards a Cross-Functional Business Strategy*

Relationship orientation implies business intelligence, that is, the capacity to understand customers' needs, behavior, and preferences, identify key customer segments and then maximize the profits derived from each of them (KPMG, 2001; Nykamp Consulting Group, 1999).

Understanding the customer is among the top five most troubling problems for hotel managers (Enz, 2001). Obtaining precise customer information is crucial to define the hotel attributes that fulfill their requirements, to foster innovative and tailor-made services, and develop targeted marketing strategies, the final goal being to acquire and retain valuable customers.

Each interaction with the customer either builds or erodes value in the relationship and then impacts future contacts, depending on the information and behavioral insight hotel organizations gain during the process and the ability to translate it into a coherent response. For example, the improvement of functional and interpersonal aspects of services (e.g., customization, personal recognition, speed, check-in and check-out efficiency, etc.) is among the top 10 attributes that make the greatest contribution to customer value in two key phases: at the point of purchase and during the guest's stay (Dubé & Renaghan, 2000).

To be successful, hotel companies must first adopt a customer-centered cultural mindset, which implies a change in cultural norms, organizational structures, and the way the performance of employees is measured and rewarded. Secondly, they have to develop a cross-functional integration between different functions and information systems (booking, marketing, sales, administration, etc.) to accelerate processes and facilitate customer information sharing. Finally, they should have a strategic view of investment in properly managed IT and adopt an enterprise-wide approach to the use and integration of IT systems (Ryals & Knox, 2001).

*Data Management and Service Customization:  
New Opportunities From Technology Convergence*

The convergence between IT, telecommunications, and media and the use of data warehousing/data mining techniques facilitate hotel organizations in managing the customer relationship and support the collection and consolidation of comprehensive data across every point of interaction, before the guest arrives at the hotel and during his/her stay (Cline, 1999; Olsen & Connolly, 2000). Call center, email, Web site, central reservation system (CRS), point of sale (POS), etc., are just some examples of these applications.

Through specific electronic devices (e.g., pay per view system, interactive TV, etc.), hotels can also store huge amounts of information on a client's satisfaction at the end of his/her stay, just before check-out procedures, which are very useful each time the customer goes back to the same property or to other properties of the same chain and generally to help plan marketing actions (frequent-stay programs, special discounts, etc.) for different key market segments.

The spread of IT creates valuable knowledge, promotes a high level of connectivity between the hotel and its guests and within the hotel departments/functions, forces out distribution inefficiencies, and enlarges the number of distribution channels available.

Yet, while hotel managers purport to emphasize a customer-oriented strategic focus, their technology initiatives do not support that contention (Namasivayam, Enz, & Siguaw, 2000). A poor IT awareness and the inability to communicate a common and consistent vision of their requirements to hotel technology vendors are the primary causes of this (Hotel Technology Next Generation [HTNG], 2002).

*Modeling Customer Intelligence in  
Hotels: The Process*

To be really profitable, the application of a CRM approach and of database marketing techniques requires large volumes of easily accessible and analyzed information. All information collected should be stored and processed into the hotel database, which allows each actual customer to be identified as a record and recognized through online details of his/her previous visit (Robledo, 1999).

The starting point for investigating the guest profile and building an effective customer database is modeling the information flows that take place in a hotel organization according to four important aspects:

1. WHO: who are the information providers?
2. WHEN: when is the information acquired?
3. HOW: how is the information collected and transmitted?
4. WHAT: what kind of information should be collected?.

*Buyers Versus Guests*

Customers generally provide information on their requirements and preferences to hotel managers and staff members at the time of purchase decision, upon their arrival, and during their stay. In turn, hotel managers and staff give them information on services offered and communicate their requests to different departments/functions within the hotel (e.g., room service, food & beverage, etc.).

Considering hotel customers, a distinction should be made between (Rispoli & Tamma, 1995):

- **buyers:** those who buy hotel services for their activities, but may not use them directly (e.g., sales accounts, intermediaries, businesses, etc.). Here there is a direct purchase decision but an indirect hotel experience/assessment.
- **guests:** those who use hotel services but may not have bought them directly (e.g., package tourists). In the last case, the experience is direct but the choice of the product experienced can be made by other actors (Fig. 1).

Apart from individual clients—*independent leisure tourists or transient business travelers*, who are buyers and guests at the same time—buyers generally include distributors like intermediaries [travel agencies, tour operators, professional congress organizers (PCOs), meeting planners, etc.] and businesses who book rooms for their leisure/business clients or their managers and staff traveling on business, who represent the hotel guests. This distinction is important to maximize the hotel’s data store, because buyers are the only information source on their clients until check-in.

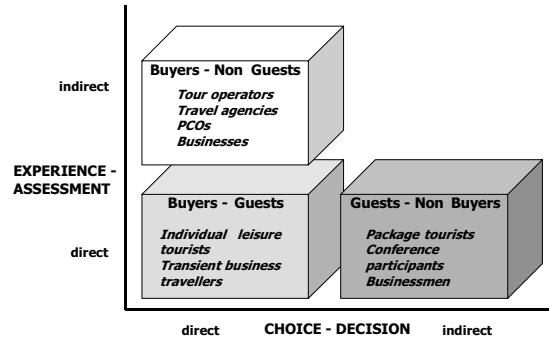


Figure 1. Demand of hotel services. Buyers and guests (adapted from Rispoli & Tamma, 1995).

Crossing PMS data on allotment agreements, fares, and economic results with the hotel guest database helps managers to identify the most profitable market segments. Furthermore, taking into account that travel agencies, PCOs, and businesses often generate the bulk of hotel turnover, the information collected on their guests, segmented by booking channels, allows the hotel organization to plan targeted promotional actions on buyers as well.

The application of the workflow theory can support hotels in optimizing business and information management according to a set of procedural rules (Workflow Management Coalition [WfMC], 2000). Following this point of view, modeling a hotel information system requires the identification of a number of information processes related or linked to each other by a client-server relationship (where the client can be the buyer and/or the guest), in which each process provides a set of services (Aguayo, Caro, Guevara, & Gonzales, 1997; Caro, Guevara, Aguayo, & Galvez, 2000) (Fig. 2).

Focusing on the interaction between the hotel and its guests, which is the main goal of this analysis, every time the client asks for a service, an information loop is generated. From the initial request (e.g., a nonsmoking room away from the lift), a negotiation process is opened during which an agreement on conditions that should ensure the maximum level of satisfaction is reached. Then an action is carried out by the hotel according to the terms agreed upon (e.g., checking room availability and assigning the room) and at the end of the process the client re-

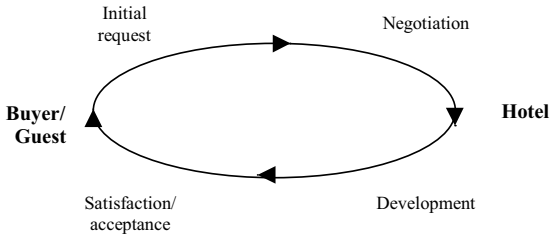


Figure 2. The buyer/guest–hotel relationship: The information loop (adapted from Aguayo et al., 1997).

ports the level of satisfaction effectively reached as regards the action carried out.

*The Guest–Hotel “Touch Points”*

Guests get in touch with hotel organizations and with single departments/functions within these organizations in a variety of different places and ways (Cline, 1999). Before arrival, they speak with booking assistants by phone or in person, contact operators at the call center or the CRS, or connect with the hotel through the Web or email. At the hotel, they ask for and provide information to receptionists upon check-in, request special services from hotel staff during their stay, and speak with cashiers upon check-out. Five main points of interaction can be identified, at which information should be collected:

- Information and query
- Booking

- Check-in
- Stay (use of hotel services)
- Check-out

At each of these so-called “touch points,” a number of information loops are generated in a sequential manner, representing the steps of the customer’s decision-making and consumption process (Fig. 3). All information collected at every step has to be recorded and stored in the hotel information system database.

Data collection during the query phase is generally omitted, because hotel managers and staff members do not find it cost-effective (because most inquiries do not translate into a real booking), even if this would provide valuable information on potential guests (e.g., why they have not chosen the hotel).

As for clients, data collection should be maximized in the booking phase, to speed up check-in procedures. The reduction of time waste in the registration process is one of the most important factors that engenders business travelers’ loyalty (Bowen & Shoemaker, 1998). Some of this information may be integrated or upgraded upon check-in. Other information must be input fully when the customer arrives at the hotel and during his/her stay (e.g., use of restaurant, bar, and other hotel facilities such as transfer, swimming pool, business center, etc.).

Across all points, it is crucial to ensure real-time customer data synchronization, because guests want

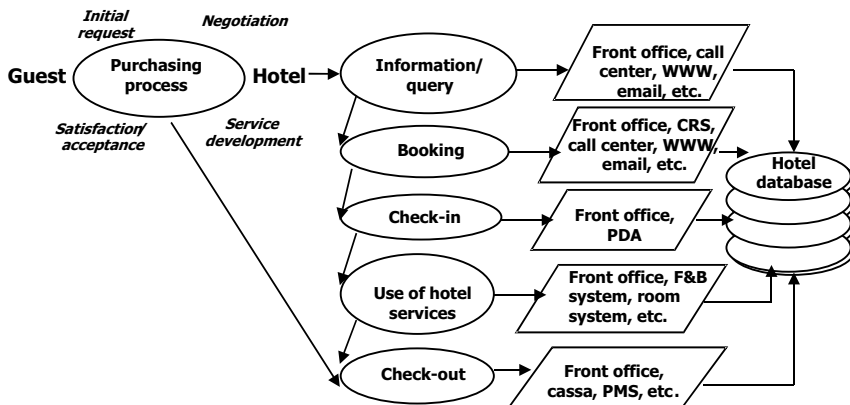


Figure 3. Modeling a hotel–guest consumption process: interaction points and IT support systems (adapted from Aguayo et al., 1997).

to give and receive information from various channels, but they do not like to repeat the same information across all those channels (Berube, Breucker, & LaFrance, 2000).

*Information Channels and Systems*

At each “touch point,” customer information and service requests can be collected through different channels and using a variety of customer-facing systems and back-end information systems (call center, front office system, email, Internet, etc.) and then downloaded into the hotel information system, which delivers orders to all hotel departments (e.g., room control system, food & beverage system, etc.).

The type of information channel generally affects the amount of information the hotel gathers at each step. For example, minimum data are generally obtained when the client reserves the room directly by fax or email (e.g., arrival and departure date, type of room, credit card information, etc.), unless he/she has specific requests. Maximum information, on the other hand, can be collected through the call center, when the booking assistant interacts with the guest and can investigate his/her preferences, or through an online reservation, where a suitable form can be arranged that “binds” the booking process to the completion of some fields.

The main issue is that each application implemented usually has its own database, creating isolated islands of information that prevent the sharing of knowledge on a customer’s behavior and prefer-

ences (Xchange Asia Pacific, 2001). This implies that each system may have personalization capabilities that independently provide a sort of guest profile, but they do not support a cross-analysis of data.

*The Guest Information Matrix*

Three basic categories of information can be identified, according to the way the information is gathered (Table 1):

1. **Front-line data:** “Compulsory” information needed to complete the booking procedure (e.g., name, address, type of room, length of stay, credit card number, etc.) and to manage the guest folio (fares, service charges, etc.). Most of this information is the same as that collected by the PMS for administrative purposes.
2. **Spontaneous data:** Information provided directly by the guest to the hotel staff, such as personal preferences and requests (e.g., a feather pillow, a special diet, an additional blanket, etc.).
3. **Behavioral data:** Information that the system records automatically (e.g., use of the hotel fitness center through a chip card that records the entrance) or that the hotel staff can input into the system by observing guest behavior (e.g., a guest that always chooses the same menu at the hotel restaurant).

The kind of spontaneous and behavioral data to be collected and the sharing of information between

Table 1  
The Guest Information Matrix

	Front-Line Data	Spontaneous Data	Behavioral Data
Personal information	Name, sex, address, date of birth, contact details, nationality, credit card number, business name and address, frequent guest, etc.	<i>Special needs and preferences</i> (diet, allergies, favorite newspaper, handicap, etc.)	Language spoken; Kind of client (e.g., fastidious, demanding, etc.)
Information on all aspects of the hotel stay	<i>Booking data</i> (time, channel, source, etc.); <i>Room arrangement</i> (type of room, bed, etc.); <i>Length of stay</i> (arrival and departure date); <i>Rate applied</i> (e.g., rack rate); <i>Accompanying persons</i> (number, name, etc.); <i>In-house expenditures</i> (food & beverage, bar, etc.)	<i>Special requests for room furniture and amenities</i> (e.g., feather pillow, orthopedic bedspring, work equipment, etc.); <i>Reservation of external services</i> (e.g., theater, car rental, restaurant, taxi, etc.)	<i>Use of the hotel facilities</i> (e.g., restaurant, shuttle bus, business center, etc.)
Guest complaints and opinions		Direct complaints, customer satisfaction forms	

different hotel departments/systems have to be carefully assessed to respect privacy rules.

The more sophisticated the information to be collected, the more complex the information tools and IT applications to be implemented, the more important continuous staff training and motivation becomes. If front-line data are generally input through the front office system, the collection of spontaneous and above all behavioral data requires the hotel employees to record every preference gleaned from conversation or observation through special devices such as, for example, "guest preference pads." In this case, an accurate and consistent recording of information depends heavily on the ability of staff to multitask across functional boundaries (Ryals, Knox, & Maklan, 2000).

Given these categories, the guest profile basically consists of three main parts (Table 1):

- **Personal information**, such as name, sex, contact details, nationality, language spoken, if physically challenged person, business address (if business traveler), means of payment, etc. This includes both front-line data (e.g., date of birth) and spontaneous data (e.g., allergies, special diet).
- **Information regarding all aspects of the hotel stay**, such as accompanying persons, type of booking (e.g., individual, group, etc.), type of room arrangement (e.g., double room, king-size bed, etc.), length of stay, type of room services required, use of food & beverage services and other hotel facilities, etc. This information includes "compulsory" data as well as spontaneous and behavioral data.
- **Guest complaints and opinions** on quality standards of hotel services and hotel staff performance, which can be collected during the stay or just before check-out (customer satisfaction), through printed forms or online questionnaires on interactive TV.

Table 1 shows the guest information matrix, obtained by crossing the two groups of information.

Supplementary information on loyal customers (such as household, hobbies, etc.) can also be derived from frequent-stay programs and then linked to the hotel information system.

#### Developing Customer Intelligence: Hotel Managers' Information Requirements and Technology Use

Once the main aspects that characterize the guest-hotel relationship had been defined, an investigation was carried out to analyze the managers' perception of the importance of building a consistent guest history, their attitude to use technology to implement it, and the main factors that can promote or inhibit its use.

At first, about 10 face-to-face interviews were conducted in Italy with managers of hotel structures chosen according to location (e.g., a city, a beach resort, etc.), category, ownership structure (hotel chain or single unit property), type of guests (e.g., leisure vs. business tourists), and PMS used (e.g., Fidelio, Hotel Cube, Sysdat, etc.), to ensure a good coverage of the market.

Starting from the results of the first phase, a questionnaire was drawn up and an email/fax survey was conducted with about 50 hotel organizations selected according to the same variables, the main goal being to analyze the data the hotel usually collects and stores according to the information matrix discussed above (Table 1), whether and how the management/information system currently in use supports this operation, the (information, technical) gaps the manager perceives, and finally the propensity to adopt a specific customer-centric interface and the characteristics it should have.

The results show that automated customer data acquisition and processing is still at the early stage of development. This not only depends on hotel category, ownership structure, and organization (e.g., multiple location, etc.), but also on management and technology culture.

Hotel chains lead the process. Hotels belonging to an international brand chain or a corporate-owned chain have already planned or are planning a guest history program or use loyalty program databases to determine their most valuable clients, even if these databases frequently do not include the most profitable clients (Cline, 1999; Schubach, 2000).

Hotels belonging to voluntary chains, franchised chains or small networks express the need to enhance their knowledge on guests, but their analyses are still based on PMS reports. Even if a guest data collection is being implemented, the guest history

is frequently not centralized and remains stored in the database of each hotel, thus preventing other hotels from sharing customer profiles.

Independent hotels lag behind. Even if these hotels (and especially SMEs) have a privileged relationship with the guest (implicit CRM), they lack a customer-oriented management culture and often do not perceive how technology can contribute to increase their profits and create value for the guest. In many cases managers still rely on staff experience and personal recognition of the customer to identify returning guests and then accomplish their requests and preferences. This can be a risky choice because of staff turnover: if the receptionist, the concierge, or the housekeeper decides to leave or retire, a valuable amount of customer knowledge created over the years can be lost forever.

Going into detail, many hotels still have poor understanding of what CRM, and particularly data management or business intelligence, actually implies. Fifty-five percent of hotels interviewed claim to produce a guest history and this is mostly managed through the PMS, rarely through a dedicated system, while 15% support data analysis with external tools (e.g., Excel, SPSS, etc.). Fifty-seven percent of hotel managers think that an ad-hoc customer information system could contribute to improving guest relationships and business growth.

Focusing on the kind of information collected, the guest history basically builds on front-line data,

Table 2  
Guest Information: Data Collected by Hotels Interviewed

Information	% Answers
Name, address, date and place of birth, nationality	100
Telephone/fax number	92
Email address	46
Mobile phone	38
Language spoken	62
Type of market (e.g., leisure, business, etc.)	69
Booking source (e.g., travel agency, business, PCO, etc.)	77
Booking channel (e.g., telephone, fax, email, etc.)	62
Name of the business (if business guest)	92
Professional address (if business guest)	62
Current position (if business guest)	23
Means of payment (e.g., cash, credit card, etc.)	69
New/repeater guest	46
Type of guest (VIP, demanding, etc.)	54
Member of a fidelity program	54

both personal and related to the organization of the hotel stay (e.g., name, address, arrival and departure dates, length of stay, hotel arrangement, type of room, etc.), and this is justified by the extensive use of PMS (Table 2). Personal requirements and preferences were recorded by a third of hotels interviewed, on average, and only if they refer to specific hotel services (e.g., bedsprings, special menus, etc.) (Table 3). Behavioral data were generally neglected, especially where hotel facilities are provided for free, or collected indirectly through charges. For example, many hotels derive the use of restaurant from expenditure made by the guest. Sixty-nine percent of hotels collect information on guests' complaints.

Guest information is mainly used by the hotel manager (100% of total answers), the marketing manager (86%), the room division manager (86%), and, to a lesser extent, by the administration (57%) and the food & beverage department (27%).

Data are basically processed to develop targeted marketing strategies (100% of total answers), ana-

Table 3  
Information Regarding the Hotel Stay: Data Collected by Hotels Interviewed

Information	% Answers
<b>Arrangement</b>	
Rate applied (e.g., rack rate, etc.)	100
Type of arrangement (e.g., bed and breakfast, half board, etc.)	100
Type of room (single, double, etc.)	100
Room location (away from the lift, sea view, etc.)	69
Smoking/nonsmoking room	62
Room with work equipment (fax, modem, etc.)	46
Type of bed (king size, etc.)	46
Additional bed	62
Cradle	46
<b>Length of stay</b>	
Arrival and departure dates	100
Length of stay (number of days)	100
<b>Special requests for room facilities and services</b>	
Room and bathroom amenities (e.g., feather pillow, additional blanket, special towels, etc.)	46
Orthopedic bedspring	31
Allergies to materials/cloths/flowers	38
Specific food and drinks in minibar	15
Preferred newspaper	38
<b>Food and beverage services</b>	
Diet/special menu	23
Preferred menu (e.g., à la carte, etc.)	8
Food allergies	31

lyze hotel operating profits (costs and revenue: 71%), define pricing strategies (57%), plan loyalty programs (57%), and enhance customer care (43%).

This result confirms that hotel managers are aware of the importance of having reliable customer information to improve the services delivered and then increase revenue, marketing, and sales, but there is a confusion between transaction-centric and customer-centric systems (i.e., between operational data and customer knowledge). They do not have a clear idea of how to get these data and whether or not the management system currently in use is able to support data collection and processing.

#### Towards a Structured Guest History: Merging Theory and Practice

The building of an operational customer information system depends on the trade-off between the theoretical information framework discussed in the third section (what kind of data should be collected) and hotel managers' requirements.

Generally, it would be simple to provide them with the information they want, but this may be not effective because, except for compulsory data, they often tend to choose the information that is easy to collect and deal with and not the information that would aid decision making (Jones, 1995).

On the other hand, an information overload may be equally unproductive, the risk being to create an amount of data too large for managers to digest or even process, thus making it hard for them to identify information useful for defining guest patterns and high-profit market segments (Olsen & Connolly, 2000).

From the hotel's point of view, a cost-benefit analysis is then required, which means to assess the convenience of different solutions in terms of:

- **technology:** the investment required to develop the system components (hardware and software),
- **time:** the time the hotel departments/staff devote to data input instead of executing other tasks,
- **human resources:** in terms of staff reallocation or enlargement,
- **training and motivation:** training of managers and staff to use the new system,

- **reorganization of internal procedures** (e.g., booking, etc.).

Given this evaluation, the main goals to be achieved and which the CIS should support are as follows:

- **on the content side:** to optimize data collection through selecting a set of primary information (especially within spontaneous and behavioral data on a guest's stay) that is crucial to improving customer care, promoting loyalty programs, and/or developing targeted marketing strategies, and a set of secondary information, which can contribute to integrating the analysis according to the specific needs of each hotel organization;
- **on the technology side:** to create a dynamic guest history maximizing the automation of data collection, also through the identification of a set of static and variable information, to significantly reduce data inputs and upgrades.

*Static or fixed data* (in the short/medium term) forms the guest's identity card, that is, the data that are input the first time the client arrives at the hotel and do not depend on the kind of hotel stay (e.g., name, address, allergies, etc.) or that represent a guest's habit. *Variable data* change according to the patterns of the hotel stay (e.g., leisure vs. business) as well as to guest behavior (e.g., use of hotel amenities).

For example, the guest history of a frequent business traveler who spends 3 days in the hotel every first week of the month, uses the same room, and has dinner in the hotel every night is basically composed of fixed information. On the other hand, a business guest who returns during the weekend with his family shows a higher level of variability in his choices.

Table 4 lists, as an example, the set of primary information, divided in static and variable data, that should be collected for a frequent business traveler.

#### Concluding Remarks and Future Work

In the future, hotel market power will lie more and more in satisfying guests' knowledge-based needs (Olsen & Connolly, 2000), and technology will accelerate this pattern of change.

Table 4

The Guest Information Matrix for a Frequent Business Traveler: Static and Variable Data

	Front-Line Data	Spontaneous Data	Behavioral Data
<b>Fixed information</b>			
Personal information	Name, date of birth, contact details, nationality, credit card number, company affiliation, company address, fidelity program member	Special needs and preferences (allergies, favorite newspaper, etc.)	Language spoken; Kind of client (e.g., fastidious, demanding, etc.)
Information on all aspects of the hotel stay	Booking data (time, channel, source, etc.); Room arrangement (type of room, bed, etc.); Length of stay; Rate applied	Special requests for room furniture and amenities (e.g., feather pillow, work equipment, courtesy service, etc.)	
<b>Variable information</b>			
Information on all aspects of the hotel stay	Accompanying persons (number, name, etc.); In-house expenditures		Use of the hotel facilities (restaurant, shuttle bus, etc.)
Guest complaints and opinions		Direct complaints, customer satisfaction forms	

Nevertheless, there is currently a great disparity between the importance the hospitality industry (and especially SMEs) places on customer relationship and the number of companies that are already committed to any form of CRM program.

Hotels, especially those that develop a customer-centric model for the first time, have to adopt a step-by-step policy, based on a learning-by-doing process. In particular, reorientating the hotel company around its customers basically requires:

- the implementation of a customer-centric strategy, which not only means information management but a change in organizational culture, business processes, and working practices (human resources empowerment);
- a clear view of the role of IT in customer-oriented programs and the ability of hotel managers to translate their technology requirements into proper investments;
- the convergence of all information systems and databases that can be used at each point of interaction (call center, CRS, front office system, Internet, etc.) into a central data warehouse, to avoid the creation of separate islands of information and facilitate “whole guest” information sharing.

This article has proposed a reference model to build an effective customer–centric system and par-

ticularly the guest information matrix on which the system will be designed, analyzing the interaction between the hotel and its guests, on the one hand, and the hotel managers’ understanding and requirements, on the other.

Starting from this model, three further developments are planned:

- Firstly, the specification of the final guest information matrix, taking into account the considerations discussed in the fifth section. A technical audit is currently under way with those hotel managers who showed the highest interest in customer knowledge and a strong commitment to creating an electronic guest profile, to test the choices made and identify the sets of primary and secondary information that should be stored in the database, by crossing front-line, spontaneous, and behavioral data. This is the preliminary step to the definition of the data model and then to the database design.
- Secondly, the design of a user-friendly interface for data input, which follows the structure of the GIM (primary and special fields) and is easily linkable to the PMS and other hotel systems (front office, room control, food & beverage, etc.), where guest data will be displayed and shared on a permission basis, according to the information needs of each department.

- Thirdly, the planning of a complete customer-centric data warehouse, which automatically retrieves key information from different customer-facing and back end information systems and databases (CIS interface, PMS, CRS, interactive TV, yield management system, Web reservation engine, etc.) as well as from external sources and builds a consistent guest history storing different profiles for the same guest. The data warehouse (DW) architecture and the data and functional models will be specified according to data structure (e.g., operational or transactional data sources), key informational dimensions of the shared database, and end-user applications (Griffin, 1998; Shin, 2003). The DW will act as a data center where information from different sources will be captured, cleaned, transformed, standardized, and then analyzed by using OLAP (on-line analytical processing) and data mining techniques (e.g., decision trees) (Min, Min, & Eman, 2002).

#### Biographical Note

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