An Integrated Property & Guest Management System
A hotel management software for the future – delivered over the cloud
Traditionally, the hotel IT ecosystem has been a multifaceted but integrated set of IT systems that developed and matured progressively to fulfill the needs of these hotels, as they became increasingly complex in their operations. Most IT systems are adopted at the intersection point of ‘maturing technology’ and ‘complexity of business operations’.

These circumstances were the breeding grounds for some of the most dominant tools in the market today, including Central Reservation Systems (CRS – a system used to centrally manage hotel room inventory and bookings for a single hotel/group of hotels) and Property Management Systems (PMS – a system used to manage the day-to-day operations of a hotel property including housekeeping and billing). There are several other important IT systems that are used by a hotel, a snapshot of which is presented in the diagram below. These have been mapped to the different stages of the guest-lifecycle at a hotel including Revenue Management and Loyalty Management Systems.

Figure 1: Hotel IT Ecosystem mapped to different stages of a hotel guest-lifecycle
What are they?

**PMS:**

A Property Management System (PMS) is a computer-based lodging information system that helps track guests, room inventory, reservations and guest (accounting) transactions. The PMS typically lies at the heart of the hotel's (property) operations and interfaces with various other applications provided by the other Independent Software Vendors (ISVs) to provide value added guest services and to facilitate efficient hotel operations.

A PMS is usually limited to individual properties. They interface with various external and internal systems to provide a unified view of the property to the general manager. These systems generally require on-property servers, other hardware and on-site expertise. Cloud-based enterprise versions are slowly becoming available, but with similar designs, functions and limitations as their traditional versions.

**CRS:**

A Central Reservation System (CRS) is used by hotel chains to centralize reservations for all of its properties onto one system. Information like rates, availability and reservation status is centrally accessible. The CRS consists of a two way interface that allows it to exchange information like rates, inventory etc. between the CRS central database and the PMS at each property, in addition to the various sales distribution channels. This is, generally, also the backbone of hotel rates and inventory distribution.

The CRS and PMS interface with one another to keep the data in the two systems synchronized. Maintaining two separate systems with data consistency is both expensive and problematic. As can be seen in the representation of the hotel PMS and CRS Functional Diagrams on the right (Figure 2 and 3), part of the data within both systems is similar.
In the earlier days, hotels were generally considered as local businesses. They relied, solely, on handwritten forms for reservations and billing. Pre-registration activities and occupancy forecasts were not common. With the advent of machines, the hotels transitioned to semi-automated electro-mechanical systems for reservations and management of other departments of the hotel. This system faced complexities while operating and controlling devices that were not integrated with the other systems. With the evolution of computers in the 1970s, computer-based Property Management Systems (PMS) were introduced at hotels. These were highly expensive physical systems, largely confined to single properties within which they were installed. The rising popularity and requirements of hotel chains necessitated the need for automated Central Reservation Systems (CRS). The main difference between CRS and PMS systems was that, CRS systems did not get involved in the functions performed after the arrival of guests at the hotel, whereas PMS managed the same. The CRS was designed to allow reservation agents to search for hotels based on several criteria, contain detailed information about the different properties and their prices. Gradually, CRS started to interact with Global Distribution Systems (GDS) and Online Travel Agents (OTAs). With the advent of website booking systems, PMS and CRS ended up being two separate systems which required near real-time synchronization between them.

What functions do they perform?

**PMS:**

- **Reservations**
  The PMS handles updates on individual and group reservations which it receives from the CRS. Reservation activities also include handling of deposits and booking confirmations, wait listing and cancellations.
- **Management of Guest Profiles**
  The PMS has the ability to maintain the complete profile of guests, which include their names, address details, preferences and other relevant information. This data may also be sourced by a centralized guest profile system.
- **Front Desk activities**
  The PMS accommodates all front desk activities like guest handling, managing messages for guests and catering to requests such as wake up calls.
- **Rate Management**
  The PMS provides features like revenue forecasting, rate quotation and control, and tools for analysis of rates. In major hotel chains, this capability may be integrated with a centralized Revenue Management System.
- **Room Management**
  The PMS enables room supervision with features for managing onsite room availability, housekeeping, facilities and maintenance.
- **Interface with other third party systems**
  The PMS interfaces with numerous other systems within the property such as entertainment systems, restaurant systems, engineering systems, telephone systems, key lock systems, etc.
- **Accounts**
  The PMS has features to support accounting activities at the property such as billing, invoicing, commission processing, statement generation, close of day processes etc. and to export these to their centralized accounting systems.

**CRS:**

- **Electronic Distribution**
  The CRS provides rate and inventory details for all properties within a hotel chain, connecting the property for distribution of inventory with channels such as the GDS and OTAs.
- **Automatic Rate and Inventory control**
  The CRS provides features to manage and store rate structures for properties and hotel chains. Agents use the system to determine the best available rates, in addition to all rates applicable to a guest availability request.
- **Interface with other systems**
  The CRS interfaces with other systems such as the PMS, Customer Relationship Management (CRM) system and the Revenue Management System (RMS).
- **Channel Management**
  The CRS is used to manage distribution channels based on several factors such as cost, market segments and accessibility to the buyer, thus gaining maximum return on investment.
- **Full Reservation functionality**
  The CRS can handle the entire gamut of reservation functionalities such as shared reservations, bookings, cancellations, group bookings, loyalty program memberships, negotiated rates, rate discounts, etc.
- **Content Management**
  The CRS also handles room descriptions, amenities, features and property description and provides these details to all distribution channels including GDS and OTAs. In major hotel chains, this data may be sourced from a centralized Content Management and/or Property Data System.
What has changed?

With great improvements in technology over the last decade, systems have become more capable and less expensive at the same time. The emergence of cloud computing has made centralized PMS a reality, thereby allowing the PMS to support the functions of the CRS. The distinction between the functions performed by the CRS and PMS, as shown in the diagram below, is diminishing. Maintenance of redundant data within these two systems leads to problems with integration and maintenance, and has proven to be more expensive.

Figure 4: Hotel Guest Lifecycle

What do we propose?
Integrated-PraGMaS delivered over cloud

Hotels can use an Integrated Property and Guest Management System (PraGMaS), to which the terminals at individual properties connect using a browser, thereby sharing a common guest history, account receivables and centralized reservations. The Integrated-PraGMaS performs the integrated functionalities of a traditional PMS and a traditional CRS as shown in the diagram below.

Figure 5: Integrated-PraGMaS Components
Advantages of Integrated-PRAGMAS

Business Advantages:

1) Product Innovation
With the redundancy between CRS and PMS removed, hotels have greater flexibility to introduce innovative products for sale such as ‘distressed inventory’, handling situations of overbooking, auctions of rooms for high-demand nights, dynamic packaging of restaurant/ spa services and prices with rooms among other possibilities.

2) Availability of a single image inventory and real-time inventory update
Integrated-PraGMaS supports both reservations and traditional PMS functions. The available inventory data is consistent and any updates to the existing inventory levels are instantly available. Current inconsistencies due to sale through OTAs, hotel walk-ins and GDS would be eliminated.

3) Improved operational efficiency
Individual properties do not have to maintain on-site expertise for the separate PMS.

This will result in reduced investment on personnel. There will be a reduction in the investments on separate systems and their maintenance.

4) Cost Reduction
With improved inventory management, reduction in IT costs, reduced investment on personnel, as mentioned in separate points, the hotel can achieve further optimisation and reduce costs across its properties by improved utilisation of its assets.

5) Consistent & Unified 360° Customer View
An Integrated-PraGMaS can help provide a complete and consistent view of a customer on an Internet Booking Engine (IBE), CRS or a PMS. The hotel chain can maintain a common guest history across the chain, thereby, enabling them to provide improved customer service by better understanding of customer needs across the hotel chain. Access to customer purchase patterns and preference details across booking and operations, on a single user interface, means that the hotel can start owning the customer relationship much earlier in the customer lifecycle. Additionally, it also provides an end-to-end view of customer details while the guest is at the property.

6) Revenue Growth
When a single view of the user interface is able to provide consolidated details on customer purchase patterns and preferences, hotels can improve sales, increase customer retention and acquire new customers. For example, with a single interface for both booking and operating systems, customer requests for extension of stays can be accommodated much easier and faster without impacting the overall operations. Even in cases of 100% occupancy, re-accommodation can be made much easier. Dynamic packaging and pricing can be achieved for products across properties. For example, a hotel chain can offer a bundled package for restaurant dinner reservations at one of its properties for guests staying at a local property.

7) Business Intelligence and Analytics
With a complete view of customer profiles, buying behaviour and consumption patterns, hotels achieve greater insights with improved forecasting and data for trend analysis.
Technical Advantages:

1) Reduced IT Infrastructure costs
The main advantage of having an Integrated-PraGMaS is the huge savings on infrastructure costs it provides to individual properties. There would be no investments for separate CRS systems and the connection to the centralized server would require substantially less investment when compared with a separate PMS. If an Integrated-PraGMaS is delivered over the cloud, cost savings can be further optimized.

2) Lesser data integration issues and reduced data duplication
Having CRS and PMS, as part of the Integrated-PraGMaS, reduces the burden of achieving real-time and consistent data by integrating the two separate systems.

3) Easier data backup for the hotel chain
Data backup can be performed centrally, thus, relieving the individual properties from having to maintain separate backup facilities.

4) Easier system upgrades
Upgrades to enterprise systems will be easier when compared to system upgrades at individual properties.

5) Reduced maintenance
Maintenance activity for the Integrated-PraGMaS would be greatly reduced, in comparison to the combined maintenance activities on separate local systems.

6) Reduced data latency and duplication
Given that the Integrated-PraGMaS is working on an integrated database, there would be zero data latency in terms of updates on customer information, product information, property information (especially rich media that needs to be distributed across the Internet) and ARI (Availability, Rates & Inventory) information. This would significantly increase data accuracy across the various channels, helping hotels promote consistency on their brands and products.
Future Compatibility

An Integrated-PraGMaS would not only be able to deliver business benefits over the current operations, but also be future compatible with newer technology trends.

1. **Cloud enabled** – Hotel management systems of the future will be delivered on the cloud so that hotels do not have to worry about the IT infrastructure and the product roadmap but just focus on their core competencies.

2. **Social integrated** – A Integrated-PraGMaS of the future would be socially integrated, helping in the creation of sub-communities, enabling social buying patterns.

3. **Mobile enabled** – Mobility is a key future trend. Therefore, like any new system conceptualised today, Integrated-PraGMaS must be mobile enabled for direct reach to the end consumer.

4. **Big Data analytics** – All rich media, customer data and click–streams would be analyzed in real-time to serve personalised and real-time recommendations to consumers.

5. **Localization & Personalization** – Integrated-PraGMaS would be served based on the local and personal preferences of target guests

Conclusion

Given that several hotels are now approaching renewal of their CRS and PMS products, this presents a significant opportunity for development of an integrated offering for both hotels as well as IT players in the hospitality segment. Companies like Best Western, Marriott, Hyatt, Accor and Intercontinental Hotel Group are all evaluating the next phase of their CRS systems over the next few years. When delivered over the Cloud, the Integrated-PraGMaS holds potential to become the backbone of IT operations for any large hotel chain with significantly high return on IT investments. The technology to serve the next-generation hotel management with software-as-a-service exists today. Now the key question is ‘who has the business will to drive the industry change?’

In due course of time, an integrated Revenue Management System to support a complete rule-based automated dynamic packaging would be the next extension of this strategy. This could be followed by integration of CRM products and mobile tools to the same backbone. But first the hotels have to take a step back to decide on the long-term IT product strategy for their companies. The future is about to unfold and the first mover would obviously hold significant advantages over its competitors.

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