Design and analysis of hotel management system based on information technology

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Abstract

With the rapid development of China's economic and tourism, competition in the hotel industry has become intense. Only by improving the means and methods of their management and improve their level of service constantly, can they receive adequate and healthy development. Therefore, the hotel operation computer management has become a priority task. These articles give a brief introduction to hotel management system design, in accordance with means of software engineering to do feasibility analysis, requirements analysis and design. The whole system divided into modules separately and introduce the function, while gives a set of criteria and the logical structure of the database of database management. These analyses and the guidelines basically meet the design requirements of hotel management system based on information technology, so as to improve the service quality and efficiency of the management of the hotel.

Keywords: hotel management, feasibility analysis, requirements analysis, database, logical structure

1 Introduction

While global economic integration make the hotel industry market wider, it also make the hotel industry facing increasingly fierce competition and rising customer expectations, forcing the insider to expand their customers constantly, improve service quality, lower administrative costs and improve customer satisfaction with new ways to enhance the hotel's core competence. Which is one of the effective means of mass application of advanced information technology, especially with the constant deepening of information, change hospitality industry competition and management models which in the traditional sense, in order to win new competitive advantages. Leading hotels in the world have been falling over themselves to explore, implement and promote integrated hotel management information. Modern hotel is the integration of consumer sites including rooms, catering facilities, business culture, and a variety of other services. Due to a huge membership and service projects, so naturally, it's the amount of carried in its management, in order to improve work efficiency, reduce operating costs, improve service quality and management levels, promote economic efficiency, we must use the computers to progress modern information management. The great development of modern computer technology, provide a favourable opportunity for hotel management to change.

2 Software architecture technology

Hotel management system have great development both at home and abroad, there are more sophisticated commercial systems, and has good application in medium to large level hotels. With the popularity and development of Internet, hotel management software based on b/s structure must occur. With the further development and enhancement of domestic software, internal software replace imported software to become the mainstream management software in high-star hotel will become inevitable. Much content in commercial systems do not suitable for hotel, and one-time investment for these systems is high. Therefore, developed an applicability hotel management software is extremely meaningful; this also is the focus of this article.

Software architecture technology based on b/s, system installation, modification, and maintenance can be solved on the server-side, which brings convenience to the hotel management, also save the cost of the hotel's technology and maintenance of the system. When an administrator uses the system, only requiring a browser could run all modules to reach "zero clients" functionality, it is easy to upgrade automatically at run time [1].

3 Analysis on management information system of hotel

3.1 FEASIBILITY ANALYSIS

The analysis of structure of hotels management information systems mainly from the use of feasibility, technical and economic aspects [3].

(1) Feasibility of using

At present, the computer-aided automation, convenient and efficient system of hotel management are

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only used by some of the star hotel management, and each hotel has different needs, but most of the existing management system's definition of a project cannot be applied to general hotel management, so identifying these specific needs is the content should be made clear first before build a management information system.

Hotel management information system using feasibility analysis mainly focused on the operator's actual situation and environmental aspects. Operation situation analysis focuses on the hotel specific section's attitudes and awareness toward management information system specific functions, such as its system or part of systems capabilities considered not needed or are not willing to use, system construction and use will appear a series of problems. Therefore, when carrying out feasibility analysis, first focused on specific sectors, particularly mission critical jobs such as hotel General Manager, Department head's awareness and orientation on the system. In addition, when system is using feasibility analysis, it should consider the environmental conditions, particularly special circumstances in business activities, such as quickly to make the guest registration and organization when receive group guest.

(2)Technical feasibility

Management information system for technical feasibility involves information processing technology (such as information processing, input / output, and response time), reliability, scalability, security, maintainability, and environmental adaptability and so on many aspects, mainly analysis whether technical conditions can smoothly carry out development work, can meet the needs of developers of software and hardware, and so on.

B/s mode may be used for development of this system, combining hItem Intranet technologies, in line with the trend of technology development. Database server using MySQL database, it is able to handle large amounts of data, while maintaining the integrity of the data and provides many advanced management capabilities. Its flexibility, security, and easy of use provides good conditions for database programming. Therefore, systems' software platforms are already mature and feasible, it is technically feasible.

(3)Economic feasibility

Economic feasibility analysis mainly analysis and assessment the construction project of the funding needs and capital efficiency, including budget estimates, the input-output ratio, payback period of investment, investment benefit analysis, and so on. The development and maintenance of this hotel management information system requires hotel put into expense, but as an important aid to the hotel management, after it put into use, it can dramatically improve the department efficiency, its business volume, improved quality of service will far outweigh the upfront investment. Therefore, hotel's selection of management information systems has high investment returns and strong economic feasibility.

3.2 REQUIREMENTS ANALYSIS

Requirements analysis is the analysis definition process of requirements, is the start of the planning and development period of the project. Needs analysis task is to thoroughly describe the function and performance of the software, identify limits of software design and software interface details with other elements of the system, defining the effectiveness of software requirements. Requirements analysis includes business requirements, functional requirements and development requirements [4].

3.2.1 Business requirements analysis

(1) Room booking capability can handle customer bookings by various means, such as phone book, online bookings, and reservations at the front desk.

(2) Rooms of the hotel have different grades, and require the system to be able to categorize the room management, and according to book different types of rooms to offer available prices, booking discount timing function settings such as lowest price, easy to fit individual traveller and group reservations.

(3) Check function

(4) Keep abreast of the current state of all whether it is available, such as clean the room, which was checked out, to track whether the guest stay. Based on client occupancy information, you need to provide a guest information management function, in order to achieve unified management to the guests of the hotel information, such as ID number for customer inquiries, queries according to the checking dates, change the guest contact information and so on.

(5) A hotel management system should have recognition module in order to distinguish each business (accommodation, registration, cashier, hospitality, and other services) to which staff action is, that means the system should set login module.

3.2.2 Functional requirements analysis

Hotel management system consists of both background and foreground parts, front office is responsible for booking, reception and cashier services, the background used for administrators to manage systems, such as setting room type, room settings, operator settings, financial management and warehouse management.

Cash register function requirements. An integrated cash register system should have the following functional requirements: cash register charge of project settings, various payment methods (cash, accounting and business summary report).

Room settings requirements: Room is the hotel's main product; room management plays an important role in the hotel business. The most important tasks in room management is to modify the status of rooms, provided the information whether room is free, for rent, clean

rooms, dirty rooms and other information, so that bring convenience to receptionist assigned room reservation. Room management demands specific functions, including modified status of rooms, room management, post management, room supplies supplements article management, room history search, to check availability with the front desk, room maintenance, housekeeping, the internal administration of print-related housekeeping report.

Financial management requirements: Finance is the core of hotel Admin, it has the following functional requirements: set up account, initial processing, bookkeeping, certificate, voucher budget, other management review post, enter detailed ledger, inquire function, processing capabilities, a variety of reports and books of output.

Warehouse management requirements: Warehouse management functions including construction management, changes in the new warehouse, adjusting prices, to deal the daily account, including records and statistics code, name, unit price, price and so on of inbound and outbound items every day or every period. Report processing, includes articles, of inbound and outbound inventory processing, goods schedules, statements processing and so on.

Operator set up module: this module is used to manage the hotel operator information, add new operator, edit existing operator information, and delete operator information functions.
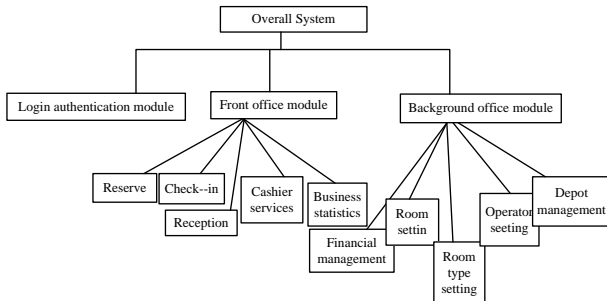

FIGURE 1 Systems function diagram

3.2.3 Development requirements analysis

Regardless of hotel scale, its future direction will be to network and information development, its main business needs mainly show in the network business process requirements and hotel information process requirements [5]. It mainly reflects in: remote query processing capabilities with the business requirements, cooperation with other relevant units of demand, as with other businesses such as hotels, travel agencies, the Ministry of public security, hotel information needs, such as electronic door locks, program-controlled exchange equipment, magnetic card consumer and other business process requirements.

4 Hotel management system design

4.1 PRINCIPLE OF SYSTEM DESIGN

Hotel management functional requirements determine the hotel management system, designed to not only take into account of conforming to the theoretical system of management information systems, but also consider the hotel industry's high level specificity required for reliability, real time management, health and safety and so on [6]. Management information system of hotel consists of front office systems and back-office system, systems are designed to do nothing but follow the general principles of design of management information system, and according to the particularity of the hotel management should also follow certain design principles.

4.1.1 Front office system design principle

(1) Concurrency considerations. In front Office system application, multiple users simultaneous access to a library that is very frequent thing, if not handled well, can cause a system deadlock, data loss, recovery difficult, seriously, it will cause incalculable consequences for the hotel business. Therefore, during system design, set a process accessing shared data or critical section, using PV operation to control the process, simultaneously in order to reduce the share of conflict, enhancing system security, and will often require exclusive use of the database into multiple, such as log file system is divided into 10: log 0~ log 9.

(2) A good user interfaces and eases of operation. Computer user request the system to complete a function through the user interface, also respond to user requests or reports through the user interface implementation. Therefore, the user interface is the embodiment of system functions in front of the user, which is to provide users with the means to use the system. Friendly interface will have: an attractive format, compatible with the screen user operation, the operation is simple and easy to learn , users can get help at any time, it mainly express through the window, menu design, screen design and so on.

(3) Safety, reliable design. With the development of networks, and in recent years many companies has exposed to disclose customer information, this also became problems to be faced by the hotel management information system. In order to ensure the safety and reliability of the data correct and effective, the system must provide a set of data protection subsystem, including security, reliability, integrity, and concurrency control and so on.

(4) Suitability. The system should develop toward the application and the future, therefore be able to adapt to different hotels in different management models, different settings, different product types, but also must be able to adapt to related equipment and system. To meet these requirements, you should open parameters as much as possible in the design of system, and when connect with

other associated equipment, facilities and services, stay well in advance as far as possible, and be able to adapt to the new trends in technological development, easy version of hardware replacement and software upgrades.

4.1.2 Back Office Design Principle

Hotel back office system design follow the general principles of software design, whose design is based on financial transaction, involves accounting (financial transaction, fixed assets, payroll, material warehouses, cash bank, procurement, etc.), cost analysis (financial analysis, cost analysis, profitability analysis, and so on), decision support, and so on.

(1) Principle based on financial accounting. Financial accounting managed by financial transactional, during the design process, it follows the following several points:

1. Uniformity and standardization. Bookkeeping voucher should use unified fill specification, for easy entry and processing, such as receipt, voucher payments and transfers in unified format. Accounting summary written to be standardized as far as possible, best use fixed lines.

2. The report generation function is the key to success of the software package.

3. Financial management system should have mandatory control functions.

(2) Principle to regard support decision-making, financial planning forecast as the guiding. A financial plan forecasts subsystem consists of the following functional modules:

1. Financial planning forecasting module function as financial forecasting and preparation of the medium-term funding programs.

2. Cost planning module can achieve its cost estimates and other functions.

3. Project budgeting module. According to the existing standards and prices, calculate the costs of projects and preparation of the project budget.

4. Investment projects feasibility analysis module is applied for feasibility analysis for investment, joint venture projects.

4.2 PRINCIPLE OF DATABASE DESIGN

Hotel management information's main task is to manage the needs of information obtained through large amounts of data, which must store and manage large amounts of data. Therefore, establish a good data structures and databases can make the whole system be quickly, easily, and accurately to manage the data you need is one of the main indicators to measure a hotel management information system development work well or bad. A good data structure and database should fully reflect the evolving situation, fully meet regulatory requirements at all levels of the Organization, should also make subsequent systems development work convenient, fast, overhead is small and ease of maintenance [7]. In order to

better organize your data and designed to meet the actual needs of the database, the system in the design mainly follow the following principles of database design:

(1) Data consistency and integrity guidelines

In order to ensure the consistency and integrity of the database, reduce data redundancy. Associations between tables is a coercive measure, once established, to the parent table and the child table's insert, update, and delete operations are take up overhead, so generally we do not identify the properties in the database design field as the primary key connect with the child table.

(2) Regulatory guidelines

When design and operation and maintenance the database, to ensure that data distributed properly across the tables in your database. Using the correct data structure and corresponding access to the database is not only easy to operate, and can greatly simplify the other contents of the application (queries, forms, reports, code, and so on), the correct table designs means that implement database normalization.

4.3 THE LOGICAL DATABASE STRUCTURE DESIGN

Considering the concepts required building the hotel management system, and does logical structure design for it [8].

Customer (name, card type, ID card number, gender, telephone number, contact address, customer registration, record-keepers, notes).

Levels of rooms (number, room level, housing prices, basic settings).

Room (room number, room level, room status, room size, position).

Reservation form (expected order number, customer ID, customer name, room level, room reservation, booking status, check-in method, an extra bed, extra bed price, deposit, expected arrival time, the expected departure time, recording time, record-keepers, note).

Stay list (check number, customer ID, customer name, room level, number of rooms, occupancy status, check-in methods, extra bed, extra bed price, deposit, arrive time, expected departure time, whether breakfast, whether wake up, whether staying secret, recording time, record-keepers, note).

Stay list's history (number, stay list number, customer ID, customer name, room level, number of rooms, occupancy status, whether an extra bed, extra bed price, deposit, expected arrival time, the expected departure time, recording time, record-keepers, note).

Changes of business list (change order number, change business customer ID, customer name, room level, number of rooms, occupancy status, whether an extra bed, extra bed price, deposit, expected arrival time, the expected departure time, recording time, record-keepers, note).

Consumption list (AutoNumber, check-in list number, customer name, consumption content, spending time, amount, note).

Consumption list (AutoNumber, check-in list number, customer name, consumption content, spending time, amount, note);

Cashier's check-list (check-out number, customer ID, customer name, room level, price, number of rooms, occupancy status, stay methods, whether an extra bed, extra bed price, deposits, accounts receivable, Actual balance, departure time, recording time, record-keepers, note).

4.4 DATABASE ACCESS TECHNOLOGY

This system can consolidate uses Java JDBC technology achieve connection of Java with MySQL. DBC (Java DataBase Connectivity Java database connectivity) is a Java API for executing SQL statements, and can provide unified access to multiple relational databases, which consists of a set of classes and interfaces written in the Java language. JDBC provides a standard API for database developers, can build more advanced tools and interfaces according to it that enables database developers to use pure Java API to write database applications.

JDBC features include a connection to the database, send a statement of the operational database and process the results. Java has a sturdy, safe, easy to use, easy to understand and can be automatically downloaded from the network properties, it is an outstanding language in writing database applications. All you need is Java application and the method of dialogue between different databases and JDBC is a mechanism for this purpose. JDBC extends the functionality of Java [9]. For example, using Java and the JDBC API can publish a Web page containing the aPPlet, the aPPlet using information from remote databases. Enterprises can also use JDBC via hitranet linked all staff to one or more internal database (even though these computers used by staff in a variety of operating systems such as Windows, Macintosh, UNIX, etc.).

T JDBC API supports two-layer model (c/s) for database access, and also supports a three-tier model (B/S). In a two-layer model, the Java aPPlet or application will have a direct dialogue with the database. This will require a JDBC driver to communicate with specific database management system. Users' SQL statement is sent to the database, and the results will be sent back to the user. Databases can be located on a different computer, users connecting over the network to the database. This is called a client/server configuration, in which users' computers is clients, provides database's computer is a server. In a three-tier model, the command is sent to the service's "middle-tier", and then it sends SQL statements to the database. Database process SQL statements and the results are sent back to the middle tier, middle tier and then sent the results back to the user [10].

5 Conclusion

At present, information management technology has been pushed at frontier of time by global information tide, thus the information management system becomes hot issue that all the society concerned about. With the development of science and technology, computer science become matures; they play an increasingly important role in all areas of society. People can give a lot of tedious work to computer systems to process, thus improve work efficiency.

Hotel management system in this paper is to analyse and design on the basis of the current development of the computer technology. Through analysis of the feasibility of the system, and a variety of needs analysis, modularize the system, analyse and give simple introduction on function of every module, then given the logical structure of the database design of the management system, provides a theoretical basis for the realization of the management system. This management system overcome shortcomings of modern operating system that computation are not strict and systematic, such as heavy workload, data transmission is not timely, error-prone management statistics and so on; enhance the competitiveness of the hotels.

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