SELECTION OF A HOTEL SYSTEM OF MANAGEMENT OF OPEN CODE

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ABSTRACT

The Computer Systems of Hotel Management (SIGH) are strategic systems for the hotel chains, the information that they register constitutes the source for the whole general statistics, as: aspects of quality, studies of segmentation, satisfaction, etc. The SIGH allow the standardization and automation of the principal functions of the direction and operation of a hotel. In the last years there have arisen several very flexible products realized with modern technologies, nevertheless the tendency in the hotel chains is to having a corporate system, while independent and small hotels use small SIGH. This variety implies using methods that contribute to the capture of decisions in the selection of the software most adapted to the specific conditions of the Hotel 'Los Laureles'. For it the method AHP (Analityc Hierarchy Process) allows the quantification of the relative importance of the criteria for the evaluation of the software's, for finally, estimate a relative weight of importance between the same ones. The above mentioned method is used in the investigation, to select the most adapted system in the management of the hotel inside a quarry of free software, concluding that the Abanq - Os is the software that can adapt to the conditions of the entity object of study.

KEY WORDS: SIGH; Multi-Method; Information Technology.

INTRODUCTION

The Information Technology and Communications (ICT) have become a source of competitive advantage and a strategic weapon, especially in sectors where information plays a fundamental role in description, promotion and distribution of their products. They can be

requirements to form strategic alliances, developing innovative distribution channels and new channels of communication with suppliers and customers (Buhalis, M., 1998).

The introduction of ICT will require and make possible changes in the structure, management style, work content and organization of the company. By redesigning processes to use the ICT, various activities, tasks or jobs can be combined into a more complex and rich; workers can make decisions in a more active way; activities are carried out in natural, logical, rational order, for supervision and control activities that are no longer needed in the new conditions are removed; and finally, redesigned processes may show operations where harmoniously combine centralization and decentralization. And obviously, the organization redesigns the influence of ICT, you must change the nature of work; change trades, people who carry the relations of direction and control, how to work measurement and remuneration, the role of managers and executives, and even value systems (Blanco, 2011).

The effective management of an organization requires objective and accurate perception of the values of information and information systems without doubt, it is essential the contribution of ICT as a tool in this contex (Fernandez; and Tañski, 2011).

Rezende and Abreu (2001) agree with Laudon and Laudon (1994) defining ICT as technological and computational resources for generation and use of information, based on the components: hardware, devices and peripherals; software and resources; telecommunications systems and data and information management.

The most used systems for hotel management called PMS (Property Management System). PMS initially were intended to solve the needs of the front office processes, ie those who have direct relationship with the customer. But over the years they have been bringing together more and more features of both the front office and the back office (Martinez J. et. al., 2006).

It is therefore necessary to have tools to discern the alternatives, so that it is considered the effect of multiple criteria, and the solution meets all consolidated basis (global) and not individual (partial). These tools include models of preference, ie, tools to address the problem of multi-criteria decision in a systematic and scientific manner, seeking to encourage the process and help the decision maker, and within these models, reference will be counted specific to the Hierarchical Analysis of diffuse processes, which is based on Hierarchical Analysis Process (AHP for its acronym in English, Analytic Hierarchy Process) which was developed by the mathematician Thomas Saaty in the late 60s and is now one of the main tools for decision making processes. The AHP is a structured methodology to measure and synthesize.

A computer Hotel Management Systems (SIGH) is a software solution in order to automate the main areas of a hotel facility and linking and integrating into one system the

different areas of the same (folder, housekeeping, reservations and commercial relations government, economy, purchasing and storage, maintenance, etc.) (Salgado Febles, 2005).

In hotels, as in any business organization, "information and technology have an increasingly strategic role ... to manage operations, improve efficiency and gain competitive advantage in rapidly changing markets" (Mazza, 2004, p. 11).

In the same they were implemented information systems across the board. Moreover, it is now necessary to use an information system to meet the current highly competitive market and offer quality levels demanded by the customer. The problems arise executives is which of the many existing tools is best suited to the specific conditions of their organization, which leads to comparative studies of these software's. To give response to such problem arises in this investigation select a computer system hotel management according to the conditions and evolution of information technology and the tourism market.

To address the problem should analyze the different SIGH most used by leading companies, primarily in systems open source, and later make a comparison between them and determine which system has a greater impact for the entity under study.

Under the premise that the processes of inadequate selection are one of the reasons for many of the failures and that each business is unique, and the cost and value of the solution you choose will depend on variables related to size, foundations and culture the company suggests that every organization needs to set their own goals, evaluate options and only then look for specific technologies and vendors (Castro et. al, 2006).

DEVELOPMENT

1. Characteristics of Hospitality Management Systems

Addressing the impact that information technology brings to organizations and primarily the human factor involvement reinforces the concern of Davenport (2001), which calls attention to the information technology can be a key factor for improving the use of information, but it can also be just one more cost to the company, if they are not considered the quality and relevance of this information and their respective users.

The computer Hotel Management Systems were and are at the level of the hotel management the flagship product of the application of ICT in the accommodation sector, standardizing and automating key functions of management and operation of a hotel.

The importance for the management activity ICT immediately stands out if we adopt as a concept manager the notion of Forrester (1972), for whom management is the person that converts information into action, which is responsible for the process of decision making. In this sense, the quality of the management function is closely linked to any technology and

system that improves the efficiency of the process of obtaining, processing, treatment and/or distribution of the information (Camison, 1995).

The hotel management systems have evolved incorporating new technologies from functionally and design aspects. It is essential that current SIGH continue to evolve into new systems that fully cover all processes at the hotel.

This evolution has led to the existence of several systems, deciding which is best suited to the conditions of the hotel under study; it should be grounded in mathematical methods. For any activity, one way or another, the evaluation of a set of alternatives in terms of a set of decision criteria, where these criteria are very often in conflict with each other (Bascetin, 2004).

In a hotel management computer system are distinguished different processes that are grouped into two categories front-office and back-office. Some of these processes have a very peculiar character because of the particularities of the services offered by a hotel.

Currently, SIGH consists of a set of more databases associated processing. Also included a number of functions for interconnection with other auxiliary systems such as call centers or POS (point of sale terminals). It is also important that a SIGH contribute the following functions:

- Assist the monitoring and control operations.
- Response to dynamic business needs.

To improve the current SIGH philosophy, it should reflect on two key aspects:

- The specific requirements of a SIGH, making it different from a general information system.
- The processes taking place in the organization for which the information system is made, that is for the hotel.

As for the first should be borne in mind that a SIGH has a number of specific front-office and back-office complex modules, for example, the reservation system, the module check-in, controlling contracts and rates or maid service and linen.

Second, it considers that in a hotel there is a close contact with the customer. This situation means that interactions are made at all levels:

- Man-machine, as is the completion of a check-in or reservation;
- Machine to machine, for example, the automatic distribution of charges between point of sale and the information system.

It can be said that in a hotel blend work done by human agents as works based on the man-machine interaction. More specifically, a hotel is an organization in which the work is done cooperatively between agents, with the aim of providing quality customer service, achieving (Company, 2011):

- Register of rooms and internal telephone.
- Entry features and telephone charges, per day and per hour for call calculating.
- Issuance of stocks, monitoring reserve until its occupation.
- Preparation of planning, with all rooms and occupation level for different days.
- It operates from the planning from which you can perform almost all tasks, such as issuing stocks, making check in and checkout, save messages, debit consumption, etc.
- Keeps records of customers with their data, and their consumption stays.
- Generation of the floating population, and can be sent by mail.
- Full customer history, with expenditures, rooms used, number of visits, etc., from previous stays.
- Graphical display of the status of hotel occupancy at present, and future projections.

1.1. Main modules of a Hotel Management Systems

In a hotel management computer system different processes that are grouped into two categories front-office and back-office are distinguished. Some of these processes have a very peculiar character because of the particularities of the services offered by a hotel.

Front Office (FO)

The programs that make up the Front Office system, allows the entry, control and analysis of information generated by hotel guests. The information is generated from the room request process, continuing the guest registration and ending with the closing of the account.

- Folder (Reservations, billing, collections, cards, Currency exchange and Safety)
- Housekeeper (Housekeeper, Fault Management and Maintenance)
- Supply Management
- Commercial (Contracts, Billing Agencies, Public Relations, VIP and repeat customers, Royal Apartments, Control and mailing customers, internal credits, Sales Analysis)

Management of point of sales terminals:

- Restaurants
- Bars y cafes
- Stores
- Other services (recreation, gym, hairdresser, beach club, etc.) (Rodríguez 2011).

Food and Drink Store

- Purchasing and replenishment management

- Supplies to retail outlets
- Payment to suppliers

Back Office (BO)

Modules that make up the hotel system application to the Back Office allows management and administrative and financial control of the company. The movements generated by operational and service areas are integrated back office applications without having to duplicate information obtained online movements for decision-making.

- Accounting and Finance
- Issue heels / Notes
- Accounts Receivable
- Basic Media
- Human Resources and Payroll

1.2 Processes of a Hotel Management Systems

In Figure 1 is observe the map that the processes should include in the SIGH. For the modeling of the system we will pay special attention to customer activities on site. That is, the customer-interaction and hotel employee interaction with the information system.

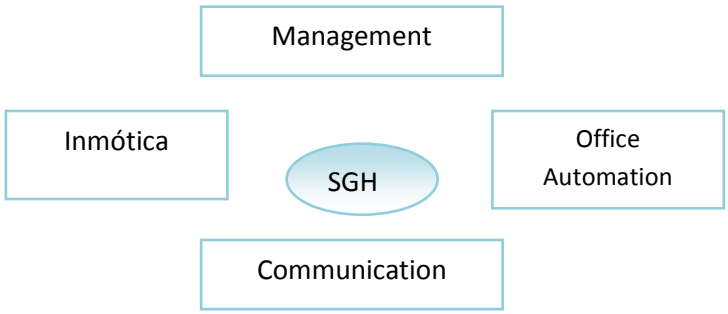

Figure 1: Areas of processes within a SIGH
Source: Rodríguez (2011)

Management Area

- Commercial, administrative, accounting and operational processes.
- Encompasses processes backoffice / frontoffice:
  1. Back office: Human Resources, management rooms, commercial, warehouse, maintenance service, decision support, accounting, etc.
  2. Frontoffice: Reception, concierge, bar, restaurant, etc.
- Parameter / Configuration:
  1. Types of room.

2. Rooms.
3. Services.

- Departments: bundled services and analysis of production centers.
- Rates.

Office Area

It is the technology necessary to carry out the work office:

- Mailings, reports, charts and graphs, etc.
- Some SIGH include office automation tools.
- There can be adapted to user needs.
- Are scheduled. Dependence apartment. Computer or company
- The SIGH incorporate integration with standard office tools (Microsoft Office: Word, Excel, Access).

2. Software Selection Method

In this work it is analyzed and understood from a particular sciencerelated to decision making case. This is referred discussion about the method known as Analytic Hierarchy Process (AHP), proposed in an integrated manner in Saaty (1980).

The hierarchical structure of the AHP is one of the peculiarities of the method, the point that is reflected in its name. In fact, no other proposals that allow such discrimination finished in the decision process, through the representation of many criteria and subcriteria as needed.

This is a method of pairwise comparison of criteria of a square matrix in which the number of rows and columns is defined by the number of weighted criteria. Thus a matrix of comparison between pairs of criteria is established by comparing the importance of each with the other, then the main vector, which sets weights (wj) which in turn provides a quantitative measure of consistency is set of the value judgments between pairs of factors (Saaty, 1980).

The importance of this method is also that after assigning weights, provides an overall measure of consistency of the matrix, which evaluates the relationship of the criteria together determine their consistency and relevance.

One advantage of the AHP method is its ability to measure the degree of consistency present in the subjective judgments of experts. This is measured by determining the ratio of inconsistency (RI) of the trials. If RI is not greater than 0.1 (less than 90% consistency), Saaty consistency suggests that, in general, is acceptable.

For the selection of software it is used the multi-selection method of Analytical Hierarchy Process (AHP) (Saaty, 1980), useful for its ability to measure the degree of consistency present in the subjective judgments of experts as follows:

a. Construction of a hierarchy of decision

Consists of separating the decision problem into a hierarchy of elements. Considering the above, two levels are decided: level 1, belonging to the criteria and level 2, belonging to the factors (Figure 2).

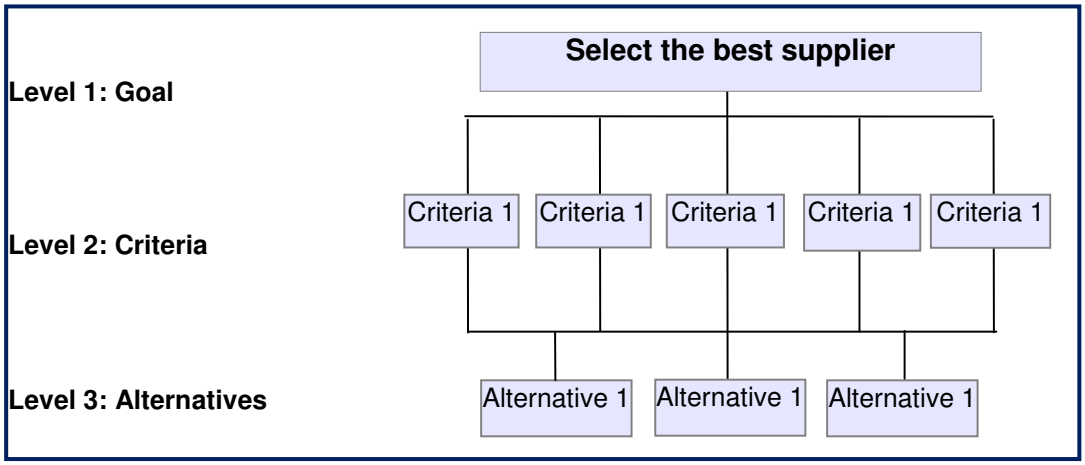

Figure 2: Analytical hierarchy
Source: Adapted from (Saaty, 1980)

b. Determining the relative importance of attributes and sub-attributes

In this method once established criteria pairwise comparisons between them are established using a measuring scale (Table N°1).

Table Nº 1: Saaty scale measurement

Numerical Value	Difinition	Explanation
1	Equal importance of the two elements	Two activities contribute equally to the objective
3	Importance of a light element facing each other	Experience and judgment slightly favor one activity over another
5	An item of considerable importance over the other	Experience and judgment strongly favor one activity over another
7	Demonstrated importance of one element against the other	An activity is strongly favored and demonstrated in practice domination
9	Absolute importance of one element against the other	The evidence that an activity favors the other is of the highest possible order of affirmation
2,4,6,8	Intermediate values between the two above	When the commitment is required
Reciprocal of previous	If an item ´i´ has a specific value, for example 3, if it is compared with a value ´j´, then this is the reciprocal value, ie 1/3 when compared with ´i´	

Source: Saaty (1980)

From the comparison between these criteria according to the expert judgment was obtained the following:

- The cost of implementation regarding the management of the hotel resources is slightly more important, about the training of personnel to implement equal and fluctuates between slightly more important, in terms of technology fluctuates between light and greatly preferred and regarding the adaptability to existing infrastructure is slightly more important.
- Hotel management about technology resources is between equal and slightly more important, with regard to the adaptability to current infrastructure is slightly more important and in terms of staff training is slightly more important.
- Training regarding adaptability is notably important and regarding the technology is equally important.
- Technology regarding adaptability ranges from slightly and more important.

Having made comparisons, the comparison matrix of criteria is made in relation to the overall objective (Table N° 2).

Table N° 2: Comparison Matrix Criteria in Relation to Global Goal

	Criteria 1	Criteria 2	Criteria 3	Criteria n
Criteria 1	1	A_{12}	A_{13}	A_{1n}
Criteria 2	$1/A_{12}$	1	A_{23}	A_{2n}
Criteria 3	$1/A_{13}$	$1/A_{23}$	1	A_{3n}
Criteria n	$1/A_{1n}$	$1/A_{2n}$	$1/A_{3n}$	1

Source: Saaty (1980)

Weights that measure the relative importance of each criterion are as follows (Table N° 3 and Table N° 4):

- Sum the elements of each column.

Table N° 3: Calculation of the relative importance of attributes

	Criteria 1	Criteria 2	Criteria 3	Criteria n
Criteria 1	1	A_{12}	A_{13}	A_{1n}
Criteria 2	$1/A_{12}$	1	A_{23}	A_{2n}
Criteria 3	$1/A_{13}$	$1/A_{23}$	1	A_{3n}
Criteria n	$1/A_{1n}$	$1/A_{2n}$	$1/A_{3n}$	1
Σ	B_1	B_2	B_3	B_n

Source: Saaty (1980)

- Divide each value of the sum of the column and from the new data, the average of each row is calculated.

Table Nº 4: Calculation of the relative importance of attributes

	Criteria 1	Criteria 2	Criteria 3	Criteria n	Media (weights)
Criteria 1	$1/B_1$	A_{12} / B_2	A_{13} / B_3	A_{1n} / B_n	a_1
Criteria 2	$1/A_{12}\ B_1$	$1/ B_2$	A_{23} /B_3	A_{2n}/ Bn	a_2
Criteria 3	$1/A_{13}\ B_1$	$1/A_{23}\ B_2$	$1 / B_3$	A_{3n} / B_n	a_3
Criteria n	$1/A_{1n}$ B1	$1/A_{2n}\ B_2$	$1/A_{3n}\ B_3$	$1/ B_n$	a_n
					1

Source: Saaty (1980)

After found corresponding weights to each criteria, different choice alternatives are compared with respect to each criteria considered, are compared in pairs, to alternative (analysis techniques) relative to each of the criteria following a analogous to that described in the previous step and obtain weights, which, in this case, represent the relative importance of each process suppliers regarding each of the criteria (Table N° 5).

Table N° 5: Comparison Matrices techniques and associated weights

Regarding to Human Experience factor					
	Alter.1	Alter.2	Alter.3	Alter.n	WEIGHT
Alter.1	1	...	...	...	b_1
Alter.2	...	1	...	...	b_2
Alter.3	...	...	1	...	b_3
Alter.n	...	...	...	1	b_n
Regarding to the level of complexity					
	Alter.1	Alter.2	Alter.3	Alter.n	WEIGHT
Alter.1	1	...	...	...	c_1
Alter.2	...	1	...	...	c_2
Alter.3	...	...	1	...	c_3
Alter.n	...	...	...	1	c_n
Regarding to resources					
	Alter.1	Alter.2	Alter.3	Alter.n	WEIGHT
Alter.1	1	...	...	...	d_1
Alter.2	...	1	...	...	d_2
Alter.3	...	...	1	...	d_3
Alter.n	...	...	...	1	d_n

Regarding to information					
	Alter.1	Alter.2	Alter.3	Alter.n	WEIGHT
Alter.1	1	...	...	...	e_1
Alter.2	...	1	...	...	e_2
Alter.3	...	...	1	...	e_3
Alter.n	...	...	...	1	e_n
Regarding to technology					
	Alter.1	Alter.2	Alter.3	Alter.n	WEIGHT
Alter.1	1	...	...	...	f_1
Alter.2	...	1	...	...	f_2
Alter.3	...	...	1	...	f_3
Alter.n	...	...	...	1	f_n

Fuente: Saaty (1980)

c. Determining the reason for inconsistency

As stated above, one advantage of the AHP method is its ability to measure the degree of consistency present in the subjective judgments of experts. The parameters for the calculation of the ratio of inconsistency (RI) of trials were determined from the following expressions: to determine the inconsistency of judgments. To this end, firstly the pairwise comparisons matrix is multiplied. [A], the main vector of weights [B], obtaining a new vector [C].

$$[A] \quad [B] \quad [C]$$

$$\begin{vmatrix} 1 & P_{12} & P_{13} \\ P_{21} & 1 & P_{23} \\ P_{31} & P_{32} & 1 \end{vmatrix} \quad \begin{vmatrix} S_{F1}/3 \\ S_{F2}/3 \\ S_{F3}/3 \end{vmatrix} \quad \begin{vmatrix} C_1 \\ C_2 \\ C_3 \end{vmatrix} \qquad (1)$$

By dividing each element of the vector [C] by its corresponding element in the vector [B] is a new vector [D]

$$D_1 \quad D_2 \quad D_3$$

$$D = \begin{vmatrix} \frac{C_1}{S_{F1}/3} & \frac{C_2}{S_{F2}/3} & \frac{C3}{S_{F3}/3} \end{vmatrix} \qquad (2)$$

The next step is to determine, by averaging the amounts in the vector D, which Saaty called the maximum eigenvalue, represented by $_{max}$

$$\lambda_{\max} = \frac{D_1 + D_2 + D_3}{3} \quad (3)$$

Inconsistency Index (CI) matrix is obtained by:

$$\mathrm{CI} = \frac{\lambda_{\max} - N}{N - 1} \quad (4)$$

Saaty has approximated hazard rates (IA) for different sizes of matrix N (based on large numbers of simulation runs), as shown in Table No. 6.

Table Nº 6: Random rates for the calculation of the Inconsistency ratio

N	1	2	3	4	5	6	7	8	9	10	11	…
IA	0,00	0,00	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	…

Source: Saaty (1980)

The Reason for Inconsistency (RI) was calculated using the following relationship:

$$RI = \frac{CI}{IA} \quad (5)$$

Given the empirical studies carried by Saaty, RI value equal or less than 0.10 is accepted. In case of inconsistency should be reviewed the parent not looking for transience.

From the results obtained above, and by the same multiplicative aggregation between hierarchical levels, the best alternative is selected. For each technique, considering the weights is obtained in relation to each of the criteria considered, multiply each of these values by the weight associated with each criteria.

$(a_1 \cdot c_1) + (a_2 \cdot d_1) + (a_3 \cdot e_1) + (a_4 \cdot f_1) + (a_5 \cdot g_1) = k_1$ (6)

$(a_1 \cdot c_2) + (a_2 \cdot d_2) + (a_3 \cdot e_2) + (a_4 \cdot f_2) + (a_5 \cdot g_2) = k_2$ (7)

$(a_1 \cdot c_3) + (a_2 \cdot d_3) + (a_3 \cdot e_3) + (a_4 \cdot f_3) + (a_5 \cdot g_3) = k_3$ (8)

$(a_1 \cdot c_4) + (a_2 \cdot d_4) + (a_3 \cdot e_4) + (a_4 \cdot f_4) + (a_5 \cdot g_4) = k_4$ (9)

$(a_1 \cdot c_5) + (a_2 \cdot d_5) + (a_3 \cdot e_5) + (a_4 \cdot f_5) + (a_5 \cdot g_5) = k_5$ (10)

Finally, the results are summed and is selected the one that reaches a larger value of k.

3. Selection of Hotel Management Systems

After the alternatives and selection of evaluation criteria through the multi method of Analytical Hierarchy Process (AHP) is defined, the best software for the entity under study is selected.

The values of the comparison between the various criteria and their relative weight are shown in Table No 7.

C_1: Application Fee

C_2: Managing resources hoteliers

C_3: Staff training

C_5: Adaptability to existing infrastructure

C_4: Technology

Table Nº 7: Comparison Matrix criteria

	C_1	C_2	C_3	C_4	C_5
C_1	1	3	2	4	3
C_2	1/3	1	3	2	3
C_3	½	1/3	1	1	5
C_4	¼	½	1	1	2
C_5	1/3	1/3	1/5	½	1

Source: Own Elaboration

Having made comparisons from this matrix are found the weights that measure the relative importance of each criteria as shown in Tables No 8 and No 9:

- Sum the elements of each column.

Table N° 8: Calculation of the relative importance of the attributes

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5
Criteria 1	1	3	2	4	3
Criteria 2	1/3	1	3	2	3
Criteria 3	½	1/3	1	1	5
Criteria 4	¼	½	1	1	2
Criteria 5	$^1/_3$	$^1/_3$	$^1/_5$	½	1
Σ	2.41	5.16	7.2	8.5	14

Source: Own Elaboration

- Divide each value of the sum of the column and from the new data, the average of each row is calculated

Table N° 9: Calculation of the relative importance of the attributes

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Media (pesos)
Criteria 1	0.41	0.581	0.27	0.47	0.21	0.388
Criteria 2	0.12	0.19	0.41	0.23	0.21	0.232
Criteria 3	0.20	0.05	0.13	0.11	0.35	0.168
Criteria 4	0.103	0.09	0.13	0.11	0.14	0.114
Criteria 5	0.12	0.05	0.027	0.05	0.07	0.063
						1.00

Source: Own Elaboration

Below in Table No 10 shows the associated weights to each of the techniques that are proposed as alternative solutions.

Table N° 10: Comparison matrices techniques and associated weights

Regarding to Human Expirence Factor						
	Abanq-Os	Opera	USALI	WFMS	Verial Soft	WEIGHT
Abanq-Os	1	3	3	1	2	0.312
Opera	1/3	1	1	1/3	1	0.114
USALI	1/3	1	1	1/3	1	0.114
WFMS	1	3	3	1	3	0.343
Verial Soft	½	1	1	1/3	1	0.114
Regarding to the level of complexity						
	Abanq-Os	Opera	USALI	WFMS	Verial Soft	WEIGHT
Abanq-Os	1	4	1	1	5	0.308
Opera	¼	1	1/3	1/3	3	0.120
USALI	1	3	1	1	4	0.250
WFMS	1	3	1	1	4	0.250
Verial Soft	1/5	1/3	¼	¼	1	0.052
Regarding to resources						
	Abanq-Os	Opera	USALI	WFMS	Verial Soft	WEIGHT
Abanq-Os	1	2	1	1	7	0.26
Opera	½	1	½	½	5	0.16
USALI	1	2	1	1	7	0.26
WFMS	1	2	1	1	7	0.26
Verial Soft	1/7	1/5	1/7	1/7	1	0.035
Regarding to information						
	Abanq-Os	Opera	USALI	WFMS	Verial Soft	WEIGHT
Abanq-Os	1	3	1	2	5	0.306
Opera	1/3	1	1/3	½	3	0.131
USALI	1	3	1	2	4	0.281
WFMS	½	2	½	1	5	0.229
Verial Soft	1/5	1/3	¼	1/5	1	0.05
Regarding to technology						
	Abanq-Os	Opera	USALI	WFMS	Verial Soft	WEIGHT
Abanq-Os	1	8	1	1	1	0.24
Opera	1/8	1	1/8	1/8	1/8	0.03
USALI	1	8	1	1	1	0.24
WFMS	1	8	1	1	1	0.24
Verial Soft	1	8	1	1	1	0.24

Source: Own Elaboration

The values obtained for $\lambda_{máx}$, and to Inconsistency Index (CI) (equations 1, 2, 3, 4) and finally the value of the ratio of inconsistency, RI (equation 2.5) acceptable for being less than 0.10. These results are shown in Table No 11.

Table N° 11: Values obtained for the calculation of the inconsistency ratio

	$\lambda_{máx}$	N	CI	CIA	RI
Comparison Matrix criteria	5.38	5	0.1	1.12	0.08<0.1
Application Fee	5.006	5	0.0015	1.12	0.0013<0.1
Managing resources hoteliers	5.12	5	0.03	1.12	0.026<0.1
Staff Training	5.01	5	0.028	1.12	0.02<0.1
Technology	5.12	5	0.03	1.12	0.026<0.1
Adaptability to existing infrastructure	5	5	0	1.12	0<0.1

Source: Own Elaboration

The result of the calculations required to obtain the priority index of each alternative is shown in Table N° 12. Expressions 6, 7, 8, 9 and 10 were used.

Table N° 12: Priority alternatives Index Calculation

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Wj
Abanq-Os	0.312	0.308	0.26	0.306	0.24	0.388
Opera	0.114	0.120	0.16	0.131	0.03	0.232
USALI	0.114	0.250	0.26	0.281	0.24	0.168
WFMS	0.343	0.250	0.26	0.229	0.24	0.114
Verial Soft	0.114	0.052	0.035	0.05	0.24	0.063

Source: Own Elaboration

The results of the priority index of each alternative are shown in Table No 13, being the Abanq-Os the best software according to the criteria of comparison.

Table N° 13: Final assessment of the alternatives

Alternatives	Índex
Abanq-Os	0.284
Opera	0.112
USALI	0.192
WFMS	0.275
Verial Soft	0.082

Source: Own Elaboration

Abanq-Os is a modular and customizable ERP. It is programmed in C ++ graphics library with QT, but allows for changes by QSA without recompiling the program. The modules are integrated with each other, this integration is necessary for reuse existing data and functionality means that some modules can not be installed without having installed

those on which they depend. Abanq-Os controls these units and warns the user when one of them is not met.

4. SIGH Implementation

After selected the best SIGH based on the above criteria comparison, you must configure the various elements in this case is defined:

• Areas: Billing.

• Modules: Warehouse.

• Actions: Item Management and Inventory Management.

They are not the only factors including Abanq-Os software, but are implemented in this research that is ongoing in later works.

System modules are integrated with each other, using the module Billing from the billing area to register an order to customer, that customer can select from a list that resides on the main module of the area. This integration, necessary to reuse data and existing functionality means that some modules can not be installed without having installed those on which they depend. Abanq-Os controls these units and warns the user when one of them is not met.

In the Warehouse module existing items attached to all data required for distribution, transfer and control are controlled, you can see the families to which they belong, sale prices, if purchased or sold, discount rates, agents fees, bar code label the product, type of barcode, minimum stock, maximum stock, physical stock, the VAT rate also allows place a product image, in short, everything you need for better identification the place of storage.

To manage items that are introduced by families are given a code and description that will appear in the table items, to insert the code then tells the family it belongs to. Additionally displays the safety stock by inserting data products have as stocks, including: warehouse that store name, product reference, quantity stored, quantity available and if there are outstanding amount receivable from the product.

These reports are of great importance to the organization because it saves time and speeds up the process because from this module can perform the bills of customers and suppliers easily without (something) is only necessary to insert the data of the budget, date, customer or supplier and it does all the work even price and value when it refers to short. This also makes it to the inventory.

CONCLUSION

With the completion of this work will arrive at the following conclusions:

1. The hotel management systems are a powerful tool for modeling business processes, especially when an increase in customer satisfaction desired. The existence of multiple solutions entails a problem of selection of the most suitable hotel conditions studied.
2. The AHP method is characterized by its flexibility, which facilitates understanding of the situation of the problems, this allows to carry out an orderly and chart the steps required in the decision making process, also, the AHP to analyze separate the contribution of each component of the model with respect to the overall goal.
3. The open source software is ideal for all companies, rich in functionality, with several vertical available and especially flexible, allowing both to customize the features available as creating new ones. Efficient implementation that can provide comprehensive results and bringing tourism businesses to be more competitive and integrate into the world market.

BIBLIOGRAPHY

Please refer to articles in Spanish Bibliography.

BIOGRAPHICAL ABSTRACT

Please refer to articles Spanish Biographical abstract.