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## QUALITY MANAGEMENT OF HOTEL INFORMATION SYSTEM

### UPRAVLJANJE KVALITETOM HOTELSKOG INFORMACIJSKOG SUSTAVA

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#### *Abstract*

An information system is the basis of a hotel as a business system. Its role is to improve the processes involved in performing, managing and strategically planning business operations. It enhances the intangible features of services and increases process and service quality through improvements and innovations. As a business system, a hotel consists of a number of interrelated subsystems. A feature of modern hotel operations is the existence of an integrated hotel information system through the use of computers. This system comprises several components (Hardware, Software, Orgware, Lifeware, Netware and Dataware) that must all possess the same level of quality. Only by continuously analysing the quality and alignment of all components is it possible to gain insight into the global quality of a hotel information system and to ensure a more efficient management process. This paper presents the results of a survey conducted among 72 hotel managers from Croatia concerning the importance of the individual components of a hotel information system.

#### *Sažetak*

Informacijski sustav predstavlja osnovu hotela kao poslovnog sustava, pri čemu ima ulogu unapređivanja procesa u izvođenju, upravljanju i strateškom planiranju poslovanja. On povećava vrijednosne karakteristika usluga te povećava kvalitetu procesa i usluga unapređenjem i inovacijama. Hotel kao poslovni sustav sastoji se od mnoštva međusobno povezanih podsustava. Uporabom računala, suvremeno hotelsko poslovanje obilježava postojanje integralnog hotelskog

informacijskog sustava, čiju strukturu sačinjava veći broj komponenti (hardware, software, orgware, lifeware, netware i dataware) koje moraju biti na podjednakoj kvalitativnoj razini. Samo permanentnom analizom kvalitete svih komponenti i njihove usklađenosti, biti će moguće stići uvid u globalnu kvalitetu hotelskog informacijskog sustava i biti će omogućeno kvalitetnije upravljanje. U radu su prezentirani rezultati provedene ankete među 72 direktora hotela iz Republike Hrvatske, koji su ispitani o važnosti pojedinih komponenti hotelskog informacijskog sustava.

## 1. INTRODUCTION

The International Federation for Information Processing (IFIP) defines an information system /1/ as a system that (1) gathers, (2) stores, (3) keeps, (4) processes and (5) supplies information vital to an organisation and society, making this information available and usable to anyone who wants to use it, including managers, clients, staff and others. The goal of an information system (IS), therefore, is to deliver the right information to the right place in an organisation at the right time at minimum cost./2/

The quality of an information system depends upon a number of factors, the most important being: /3/

1. the quality of the methodics of development (approach to development, development-process pattern, methods, techniques, aids),
2. the quality of the technical base (computers and other equipment, communication

infrastructure, compatibility of the system's structure),

3. the quality of software (operating system, database management system, communication software, application software).
4. the organisational level the business system has reached, and
5. the quality of users.

Hence, no single component of an information system can be blamed in advance for a system's inferior quality. On the other hand, it is wrong, in terms of methodology, to attempt to foresee which of these components would be the one most likely to raise the system to a higher level of quality. Therefore, only by analysing the quality of all components is it possible to gain insight into the global quality of a system and identify promising ways of enhancing its quality.

As the research subject of this paper is the quality management of hotel information systems (HIS), the paper's second section examines the characteristics of a hotel as a business system, with special emphasis on its integrality. An integrated HIS refers to a system created according to a unique concept covering all aspects of hotel business, as an organised whole, but based on the defined interrelations of all its subsystems. /4/

The third section describes HIS components and presents the results of a survey conducted among hotel managers in Croatia. At the end of the paper, closing remarks are given on the subject of HIS quality management.

## 2. INTEGRATED INFORMATION SYSTEM OF A HOTEL AS A BUSINESS SYSTEM

As a business system, a hotel is made up of a multitude of interrelated components, aimed at achieving certain economic and social goals. In the field of business, a hotel – that is, a business system that belongs to the sphere of social systems and differs fully from natural or technical systems – is a complex, dynamic, stochastic, open and organisational system.

A hotel is a complex system because it consists of a number of components (subsystems) that, themselves, have all the attributes of a system. If this complexity is viewed from the perspective of functionality, a hotel can, for example, comprise subsystems such as those engaged in selling accommodation capacities, preparing and providing accommodation services, purchasing, preparing and providing food-and-beverage services, preparing and providing additional services (other than food and lodging), hotel maintenance, human resources managements, finances and accounting, and others.

A hotel is a dynamic system, as it is characterised by steady progression and development. In a hotel, stasis can exist only for a single moment, as a specific point along the continuous line of dynamic progression. A hotel's dynamism and level of development are preconditions to its survival as a business system.

A hotel is a stochastic system, implying a considerable level of uncertainty or numerous probabilities in its operations. Namely, a high level of surprise is likely within a hotel as a system, as well as within its environment. This is because a hotel is not a self-regulating system, but rather a system that needs to be managed if it is to perform properly.

A hotel is an open system, located within a specific milieu (environment). The environment of

a hotel is made up of other hotels (rivals) in a given tourism destination, other hospitality establishments providing accommodation, food and beverages, travel agencies, and other businesses in different fields of activities, etc.

A hotel is an organisational system, because it is a product of the creativity of people, and it comprises elements of natural and technical systems. In terms of organisation, workers make use of natural regularities in processing nature to create means of labour and means for consumption, and in this way, they fulfil the purpose for which the system exists.

Every complex system, including a hotel as a business system, possesses several attributes, the most important of which are: /5/

1. objectives,
2. functions,
3. structure,
4. input,
5. output,
6. process,
7. code of behaviour,
8. performance,
9. environment, and
10. information.

These system attributes are mutually and purposefully related in such a way so as to create a kind of abstract system that serves as an aid in designing, organising and improving a hotel as a business system.

The process of obtaining information is carried out through an information system, and information and information flows can be said to represent the material structure of an information system, with data as its input. Information, as meaningful and useful facts for the end user, is the result of data processing. /6/

Within any system, there is a prominent subsystem that connects and combines all other subsystems. This is the information system that represents a set of people and practices for gathering, transforming and submitting information within an organisation. /7/ In addition to the function it has in connecting and combining a system's components, an information system also has a role in setting up existential relationships and links with relevant systems within the environment. /8/

An information system can be described by its five key components: /9/

1. information and information flows,
2. functions,
3. transactions and processes,
4. communication and coordination,
5. decision-making.

For the purpose of this paper, it should be noted that an information system is a system that operates within a hotel (as a business system) enabling it to communicate internally and with its environment. The information system is, therefore, a subsystem of a business system. Material flows (supplies, raw

materials, energy) and information flows enter and exit a business system, and its information system absorbs all information, processes it and presents it in its processed form to the business system or its environment (Figure 1).

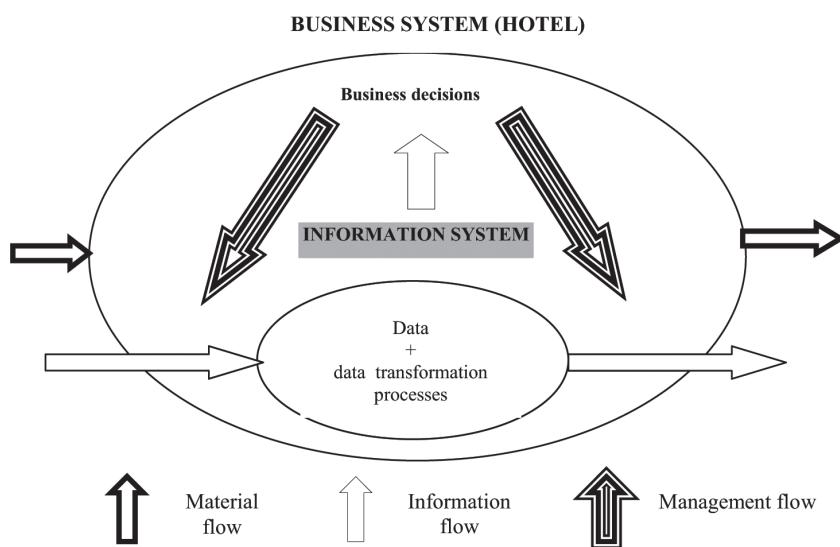


Figure 1: IS as a subsystem of a (hotel) business system

Source: modified after: Varga, M., Baze podataka – Konceptualno, logičko i fizičko modeliranje podataka, Društvo za razvoj informacijske pismenosti (DRIP), Zagreb, 1994, p. 3.

How important it is for an information system to perform properly is reflected in the effects it has on creating added value within an organisation. As illustrated in Figure 2, the effects of an information system can be three-fold:/10/

It helps to improve processes in performing, managing and strategic planning.

It helps to enhance the intangible features of services provided.

It helps to enhance the quality of processes and services through improvements and innovation.

Source: Kroenke, D., M., Management Information Systems, Second Edition, Mitchell McGraw-Hill, New York, 1992, p. 147

Although it might seem invisible, a good information system is the brain of the business system which, to survive, must possess an

information system of its own with established information activity practises. From the user perspective, the quality of an information system is manifested through two primary aspects (Figure 3): /11/

Source: Panian, Ž., Kontrola i revizija informacijskih sustava, Sinergija-nakladništvo, Zagreb, 2001, p. 259.

The perceived utility of a system refers to a user's subjective evaluation of the likelihood that the use of an information system will increase the efficiency of the user's performance within an organisational context.

Perceived simplicity of using a system refers to the degree to which users expect they will be able to use a system without any great efforts on their part.

There are potentially many characteristics of an information system's hardware and software components that impact on these two perceptions, and users will be able to spot some of these system characteristics even in brief interaction with the system. /12/

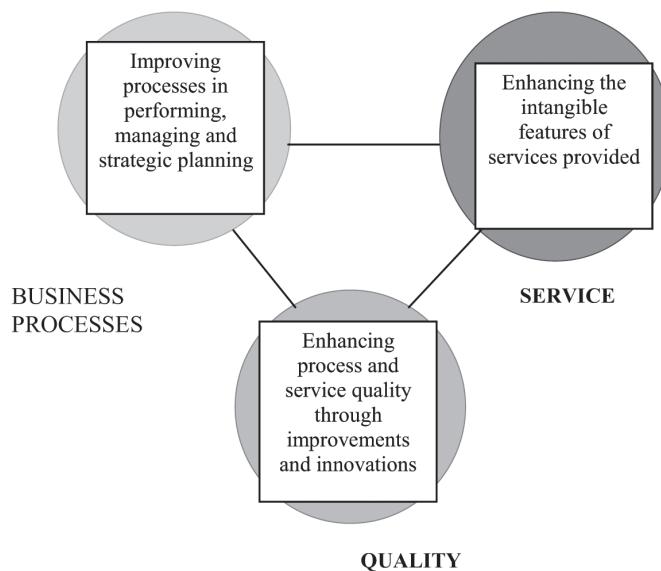


Figure 2. IS role in creating new value

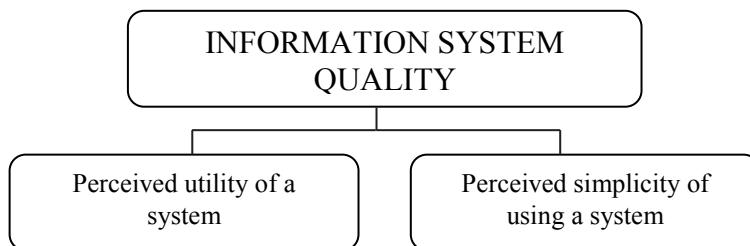


Figure 3: Manifested IS quality from the user perspective

### 3. QUALITY OF HIS COMPONENTS

In principle, the components of a data processing system consist of equipment (*Hardware*) and programs (*Software*) for this equipment. However, in addition to software and hardware, efficient performance also calls for trained people to operate the system (*Lifeware*), the application of organisational methods (*Orgware*), the interconnectedness of a system (*Netware*) and an organised database (*Dataware*) /13/. A data processing system is referred to as an information system, the structure of which is made up of the above system components. At today's level of technological development, a modern information system is a system the structure of which consists of: a tangible and technical component (*Hardware*) that is made up of all the machines, equipment and means used exclusively or predominantly for processing data and information.

an intangible component (*Software*), which is the totality of human knowledge embedded in machines, equipment and devices, representing the subject of processing or dictating the manner of processing in a system.

a human component (*Lifeware*), which consists of all people participating in whichever capacity and for whatever purpose in the system's operation and using the results of data and information processing.

a transmission component (*Netware*) consisting of means and links for transmitting data (information) long-distance, that is, a system's telecommunications means and links. Netware means linking a system's components and parts in terms of communication. Netware represents a combination of the tangible-technical component (hardware) and the intangible

component (software) that enable communication within a network.

an organisational component (*Orgware*) that represents all the measures, methods and regulations used to coordinate the operation of the above components to make them form a harmonious whole. *Orgware* is the result of achievements in organisational sciences, as well as the outcome of advancements in informatics, which has a considerable effect on the methods and technology used in carrying out work, and, in turn, on organisation.

a data component (*Dataware*), which relates to organising databases and information resources. *Dataware* is used more often in large systems in which it is necessary to design databases that different users can use. This gives rise to the problem of how to protect a system from unauthorised use and it also involves having different degrees of authorisation in providing access to data and information.

For an information system to perform successfully all the above components need to be on an equal level in terms of quality, and they should be mutually coordinated to ensure they are managed as best as possible. The following section presents the results of a survey conducted among hotel managers in Croatia to study how the quality of IS components is managed.

The survey involved 72 hotel managers from the entire territory of Croatia /14/. As Table 1 shows, of the total number of respondents (72) who completed the questionnaire, 54 (75%) were men and 18 (25%) were women.

Table 1: Sample pattern

|       | Number | %      |
|-------|--------|--------|
| Men   | 54     | 75,0%  |
| Women | 18     | 25,0%  |
| Total | 72     | 100,0% |

Source: processed survey results

Of the total number of male respondents, the hotel manager with the shortest employment record had only two years of experience, and the manager with the longest employment record, 39 years of work experience. The shortest length of service in a managerial position was 3 months, while the most experienced respondent had been working as a manager for as many as 30 years.

The shortest employment record of female hotel managers is only 2.5 years of experience; the longest, 31 years of work experience. The female manager with the shortest employment record had only one year of experience at a managerial position, while the most experienced had been working as a hotel manager for 10 years.

It is evident from the data in Table 2 that the average employment period of male respondents amounts to 23.1 years of which 10.3 years account for employment in a managerial position. For female hotel managers, the average employment period amounts to 15.2 years of which 3.4 years account for employment in a managerial position. This fact supports the argument of the low prevalence of women in managerial positions.

Table 2: Overview of employment period, and years of service in a managerial position

|       | Average employment period | Average years in a managerial position |
|-------|---------------------------|--|
| Men   | 23,1                      | 10,3                                   |
| Women | 15,2                      | 3,4                                    |
| Total | 21,0                      | 8,6                                    |

Source: processed survey results

Richard F. Nolan, American economist and Harvard School of Business professor, has set a so-called law of minimum IS quality which states that the quality of an information system is equal to the quality of its worst component. In other words, the quality of a process in a given information system is the sum of the qualities of its components. This means that no single component of an information system can be blamed in advance for the system's inferior quality.

According to survey results shown in Table 3, respondents consider Lifeware to be the most important component of an information system. Obviously, managers are aware of the importance and role of people in making information systems work. Practical studies conducted abroad, as well as in Croatia, are unambiguous in pointing out the fact that the human factor is indeed a limiting factor to quality in the majority of information systems. The respondents have rated *Dataware* as the least

important component of a hotel information system. This can be ascribed to the fact that Dataware is the “youngest” of the components, and there still does

not exist a developed system for warehousing data or an organised method for accessing data at various levels of management.

Table 3: Importance of HIS components

| <i>HIS component</i> | <i>Ranking of HIS components by importance</i> |
|----------------------|--|
| Lifeware             | 1  |
| Orgware              | 2  |
| Software             | 3  |
| Hardware             | 4  |
| Netware              | 5  |
| Dataware             | 6  |

Source: processed survey results

Although the majority of respondents consider Lifeware to be the most important component enabling a system to function properly, obviously this is not the case in practise, because in the category

of the worst component, Lifeware was ranked as high as second (first place went to Netware) (Table 4).

Table 4: Worst HIS component

| <i>HIS component</i> | <i>Worst HIS component</i> |          |
|----------------------|----------------------------|----------|
|                      | <i>Total</i>               | <i>%</i> |
| Netware              | 20                         | 27,8%    |
| Lifeware             | 17                         | 23,6%    |
| Orgware              | 12                         | 16,7%    |
| Hardware             | 9                          | 12,5%    |
| Software             | 8                          | 11,1%    |
| Dataware             | 6                          | 8,3%     |
| Total:               | 72                         | 100,0%   |

Source: processed survey results

The high ranking of Netware and Lifeware as the worst components points to the fact that insufficient knowledge, competencies, skills, motivation and/or willingness of people makes it impossible in practise to use fully, or at least to a considerable extent, the nominal, installed hardware, software, communication and organisational potential of information systems. As a result, this may lead to an inconsistency between the substantial investments to such systems and the fairly modest benefits that they yield. The solution to this problem lies in providing training to people to enable them to make better use of IT products and services, that is, in raising the general level of information literacy.

#### 4. CONCLUSION

Managing quality in all segments of business is an imperative of modern hotel management. Where hotel information systems are concerned, the fundamental principles of managing HIS quality come down to the following: /15/

The appropriate methodics must be developed to measure the quality of the system's individual components.

The appropriate quality indicators must be established for each of the system's components.

A method must be defined by which the general quality indicators of the overall system can be derived based on analysing the quality of its components.

If the components are found to be unequal in terms of quality, it is necessary to invest heavily in the worst component.

If all the components are of equal quality, further investments should be distributed evenly among them.

Adherence to the above principles will create the conditions needed to carry out a good quality policy of an integrated hotel information system. However, what is usually missing in practise and what is, no doubt, of the utmost importance is having this quality policy carried through.

The results of a survey conducted among hotel managers in Croatia show that for the majority of respondents Lifeware is the most important component of an information system, and Dataware, its least important. The hotel managers consider Netware to be the worst component within an information system, followed closely by Lifeware. These results point to the importance of the human factor in considering the quality of an integrated hotel information system.

Getting a hotel information system to work is a great challenge for the entire organisation and all the people that are a part of the organisation. This includes two interest groups of people: the end users and the personnel in charge of IS development.

Finally, it can be concluded that only by analysing the quality of all components can insight be gained to the global quality of a hotel information system, which will, in turn, impact on increasing the overall competencies of hotel management.

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