

# OPINIONS OF THE CONSULTANTS AND CERTIFICATION HOUSES REGARDING THE QUALITY FACTORS AND ACHIEVED EFFECTS OF THE INTRODUCED QUALITY SYSTEM

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In the creative application of quality system and achieved effects in organizations, it is very important to consider this issue from several angles. The most common way of viewing it is from the point of view of the organization, but we must not forget those who have participated in the overall process of introduction and certification of quality systems in organizations. These are primarily the consultants and certification houses. Besides them, the possible angles of observation are also coming from the point of view of customers and suppliers. This work presents the results on opinions of the consultants of quality system and certification houses about achieved effects in organizations with introduced quality system, in Bosnia and Herzegovina. The research was conducted on 31 consultants and 11 certification houses, where the opinions of consultants and certification houses about factors affecting the quality were studied firstly, and then followed by the opinions of consultants about achieved effect in 14 offered factors (effects). According to the opinions of consultants and certification houses, the introduced quality system in organizations in Bosnia and Herzegovina affected most of observed factors, except for the factors relating to the employees and increment of innovations.

**Keywords:** *certification houses, consultants, effects, quality factors, quality system*

## Stajalište konzultanata i certifikacijskih kuća o faktorima kvalitete i ostvarenim učincima uvedenog sustava kvalitete

Izvorni znanstveni članak

U kreativnoj primjeni sustava kvalitete i ostvarenim učincima u organizacijama, veoma je važno sagledati ovo pitanje iz nekoliko kutova. Najčešći način promatranja je sa strane organizacije, ali ne smijemo zaboraviti ni one koji su sudjelovali u cjelokupnom procesu uvođenja i certificiranja sustava kvalitete u organizacijama. To su u prvom redu konzultanti i certifikacijske kuće. Osim njih, mogući kutovi promatranja su također i sa strane kupaca i dobavljača. U radu su prikazani rezultati o mišljenju konzultanata sustava kvalitete i certifikacijskih kuća o ostvarenim učincima, u organizacijama s uvedenim sustavom kvalitete, u Bosni i Hercegovini. Istraživanje je provedeno na 31 konzultantu i 11 certifikacijskih kuća gdje su prvo istraživana mišljenja konzultanata i certifikacijskih kuća o faktorima koji utječu na kvalitetu, a zatim su istraživana njihova mišljenja o ostvarenom učinku na 14 ponuđenih faktora (učinaka). Uvedeni sustav kvalitete u organizacijama u Bosni i Hercegovini, prema mišljenju konzultanata i certifikacijskih kuća, utjecao je na većinu razmatranih faktora, osim faktora koji se odnose na zaposlene i povećanje inovacija.

**Ključne riječi:** *certifikacijske kuće, faktori kvalitete, konzultanti, sustav kvalitete, učinci*

## 1

### Introduction

Global market changes, new technologies in all fields, new manufacturers and suppliers, increasing demands of customers and users, new demands and constraints of targeted markets cause a new style of business management system where managements have to find effective and quick solutions. Increasingly, you can hear that only systems that continuously improve their business and strive to be ahead of the competition have a chance to preserve their status, improve their business and market position [1].

So, we can say that for the organizations, as well as for the individuals in the organizations, the time of peace and relaxation is gone for good. The market as a top criterion for success, and "giant" struggle led on it, narrowed the space for the lack of professionalism, incompetence and inferiority. There is no more "safe" position in the market. This is why many organizations – the ones on "top", the ones which want to get there, and also the ones which want to stay in "the game", very seriously, responsibly and comprehensively think about all aspects of their work.

This means to produce what the market wants, at a certain level of quality, affordable price and delivery times, continuously increasing satisfaction of customers and other interested parties. In the competitive struggle the price is no more a decisive factor, but the product quality and reputation of the manufacturer. The quality has become a fundamental factor of effectiveness and basic principle of operation of all successful business systems.

One of the ways to achieve quality and quality management in organization is the series of ISO 9000 standards. The series of ISO 9000 standards has been

developed in order to assist organizations in establishing effective quality management system. All of them together (ISO 9000, ISO 9001, ISO 9004, and ISO 19011) represent a harmonious wholeness which facilitates mutual understanding. The primary goal is to bring organization closer to the business excellence. In fact, basic assumption is that the effective management of organization is a result of introduction and maintenance of such *quality management system* (management) which provides a steady improvement of business, while respecting the needs of all stakeholders.

## 2

### The position and the role of the consultants and certification houses during introduction of quality system

Introduction of quality management system according to the requirements of ISO 9001 standard, without any doubt, represents the first serious step in each organization on the path to providing business and organizational excellence as well as the competitive advantage.

There are numerous obstacles on a challenging road to the effectiveness of business and organizational excellence. One of the most difficult ones is human (not) understanding of the constant flux of change. Such is the case when it comes to development of quality management system. The greatest number of problems that occur during the realization of projects of quality management system are the result of misunderstanding of the essence of standard, that is its principles. We must not forget the fact that the problems that appeared during the implementation of standards ISO 9000:1987, and especially the ISO 9000:1994 are not the result of misplaced foundation, because their further

development confirms the fact that it is a process of continuous improvement, based on growing up through the experience. The building of effective quality management system in most cases remained "a dead letter on paper". Such situation was mainly caused by the following two reasons: (1) insufficient knowledge of management and its key principles, and (2) creating a generation of quality experts (consultants and auditors) who believe that the essence of ISO 9000 standards is in conformity with the requirements of ISO 9001 standard (formerly Items 1-20, and now 4-8).

The new structure of standard is primarily oriented towards results rather than to the methods; towards processes rather than to the procedures. Therefore, it is necessary to do significant change of thinking when it comes to quality, because both standards (ISO 9001:2008 and ISO 9004:2008) must be treated as a "consistent pair" that only jointly can contribute to the achievement of business objectives of organization. Thus we reduce the risk of separation of business goals and objectives of quality, which contributes to the real integration of quality management system into a system of management of organization.

Consultants would basically need to be advisers who help the organization to prepare and adopt a strategic plan and organize necessary resources for building a quality system. They should act as trainers, on the sidelines, to encourage and motivate employees to perform tasks needed for certification. Educated and capable consultant usually works with several organizations and learns from there some of typical traps that are set before the organizations on the path of introducing quality systems. Since they identified many types of problems, they understood that it was possible to overcome these problems, and certainly should be less discouraged or frustrated with potential problems in any organization. Also, their experience and less emotional commitment to the organization they work for, can bring new perspectives and look at problems as well as more real estimation of solutions for possible problems [2].

Good consultants want to minimize the time spent in organizations, and try to provide for organization everything that is needed in order to keep people understanding quality system as something of their own but not something of the consultants'.

The most important advantage and thing that consultants should provide for the organization is that the employees are in the possibility to use and maintain the quality system upon their departure. Unfortunately, there are opposite cases in practice too.

The research conducted in Bosnia and Herzegovina [3] indicates high participation of consultants in the preparation phase of organization for certification, even 91,67%.

As for other researches referring to the consultants and their perceptions of achieved effects we will mention only two.

In the year 2005 Lagrosen and Lagrosen conducted a survey of opinions among 256 Swedish experts [4], who were professionally dealing with quality. They divided the area of overcoming of quality in three levels: principles, models (ISO 9000, EFQM, Swedish Award for Quality, Baldrige Award Quality) and tools (flow charts, seven quality tools, FMEA...), and the survey found the presence of each of these three levels. During this survey they established that there was noticed the effectiveness of quality system in a strong relationship with perceived

importance of principles on which the standards and models were based, and with the great use of quality tools. It is particularly important that, in order to have proper understanding we have to give importance to principles of constant improvements, management on the basis of facts and involvement of all employees. As for the usage of ISO 9000 standards the respondents sighted effects in the area of improvement in business processes, increment of participation of employees and improvement of customers' satisfaction. Researchers emphasize that the weakness of survey is considering of opinions of respondents only about the effects, rather than independent data.

In year 2006 Heras, Landin and Casadesus conducted a survey of opinions on the group of Spanish experts for quality systems (directors, **consultants**, examiners, assessors, academic specialists and representatives of influential organizations) pursuant to the Delphi method. Heras, Landin and Casadesus assessed opinions of interested groups in two rounds and by in-depth interviews. According to the opinion of respondents, the effects of both usage of quality system standard and excellence module are positive, and this is primarily due to improvement in the area of business, effectiveness and costs reduction within business processes. Respondents also underlined significant difference between only minimal satisfaction of requirements of ISO 9001 standard and desire for improvement according to the excellence module EFQM where the first one would represent only a rate of satisfaction, and for the second one, the organizations would fight for the rating of excellent, and therefore the effects on business results would be significantly different. The survey differs from others because it is not interested in only average opinion of respondents, but determines various levels of consensus within the various groups [5].

When you decide to certify organization, one of the important steps is to select a house which will evaluate you and decide whether you meet the criteria for certification or not. You can choose on the basis of recommendations by your friends, or upon heard presentation, or available written material or by the review of web sites that these houses are presented on. Of course, the great and decisive factor is the certification costs.

In the research [6] conducted in Saudi Arabia on 175 manufacturing certificated organizations, besides the research of achieved effects of introduced quality system, the research was conducted on the factors affecting the selection of certification house and problems associated to certification houses. Data collection was carried out by a survey where the five-level Likert's scale was used for evaluation of some researched factors.

Among factors that organizations have underlined as affecting their selection of certification house, the following are separated:

- Reputation and image of certification house (AV=4,65 and SD=0,64)
- Experience in Saudi Arabia and industry (AV=4,61 and SD=0,67)
- Procedure simplicity of auditing of certification house (AV=4,59 and SD=0,70)
- Certification costs (AV=3,89 and SD=1,11)
- The similarities with organizations upon certification (AV=3,35 and SD=1,33)
- Consultations with partnership organizations or partners (AV=3,25 and SD=1,40)
- Recommendations from other organizations or persons (AV=2,78 and SD=1,35)
- Private connections (AV=2,69 and SD=0,79).

The most common problems that arise in relationships with certification houses are:

- Certification price is high (AV=4,34 and SD=0,79)
- Certification procedures are complicated, and certification time is long (AV=3,90 and SD=1,08)
- Selection of the appropriate certification house is difficult (AV=3,67 and SD=1,18)
- Lack of knowledge about the industry (AV=2,65 and SD=1,26)
- Skepticism about the morality of the evaluator (AV=2,56 and SD=1,35).

The fact is that, today in market, there are great numbers of both the consultants and certification houses who offer various solutions for „your problem“. Not all certification houses have the same ways of understanding of standard, and some of them have more flexible arrangements for auditing. This means that two organizations in the same sector checked by various certification houses can apply standards in very different ways [7].

Auditors of certification houses should be skillful enough and competent to assess whether some business system is really complied with the requirements of international standard. Without meeting all these requirements he should not be issuing the certificate. Even if there is an overlook due to insufficient experience by the auditor who performs certification audit, it can be still fixed through the controlling audits which are performed on yearly basis.

After issuing the certificate, each certification house has the obligation to follow and re-evaluate certified organization every year. Organization has to prove working in accordance with the requirements of standard and that it constantly improves the system. Is it so for now it is difficult to determine, but it is clear that those organizations which obtained certificate in inappropriate way will be punished by the market.

What is more important to emphasize here is mixing of roles of internal resources and external consultants, certification houses and bodies, and their mutual connection and their mutual work. For this reason, the USA, inter alia, has passed the Sarbanes-Oxley Law whose provisions preclude that the revision of the system (certification) is performed by the same certification house that has got advisory function (the consultant). Unfortunately, in many cases there is connection between consultants and certification houses. We support this connection only if it is on high professional level.

### 3

#### Methodology of research

Research of the effects of B&H organizations which have introduced and certified their quality system according to demands of standard ISO 9001:2000 (which was valid at the time of research) is defined in this paper as empirical research (because authors have chosen direct observation of selected segment from the real environment and analysis of collected information in it) [3]. For collection of quantitative information was used one of four main ways – a questionnaire. Authors shaped the questionnaire in a way to have it as simple as possible (for usage and understanding), thorough and reliable, made in the way of claims and questions so that its filling needs as less time as possible. In view of time dimension the research was limited only with one time point, i.e. research of the time review, while from

the point of view of originality the research goes towards research with primary performance because it is based on original empirical data. It is one of the first researches on that area in selected environment (Bosnia and Herzegovina) and in such volume. The research is structured in the way to enable comparison or possible repeated performance after certain time, and in time it could become starting research (starting point) of study which could be continued on that "follow-up study" [8, 9].

#### 3.1

##### Triangulation method

During integral research presented in [3] authors used triangulation method. It refers to the usage of more than one approach in procedures of researches in the purpose of strengthening of trust into results of researches. Webb and Denzin defended the fact that *a hypothesis verified-experienced by more methods is worthier than the one that is verified-experienced by only one method*. Denzin recognizes four sorts of triangulation: methodological triangulation, data triangulation, triangulation of research and theoretical triangulation [10].

In this paper **data triangulation** is used in a way that authors could gather information on the same issue from various sources, as well as the usage of different kind of information (qualitative and quantitative) collected by various methods. Information that refers to the problem of research of effects acquired by organizations in B&H was given by the following sources (Fig. 1) [3]:

- Organization with certified quality system according to ISO 9001:2000 (which was valid at the time of research),
- Consultants who worked on preparation of those organizations for introduction of quality system, and
- Certification houses that certified those systems.

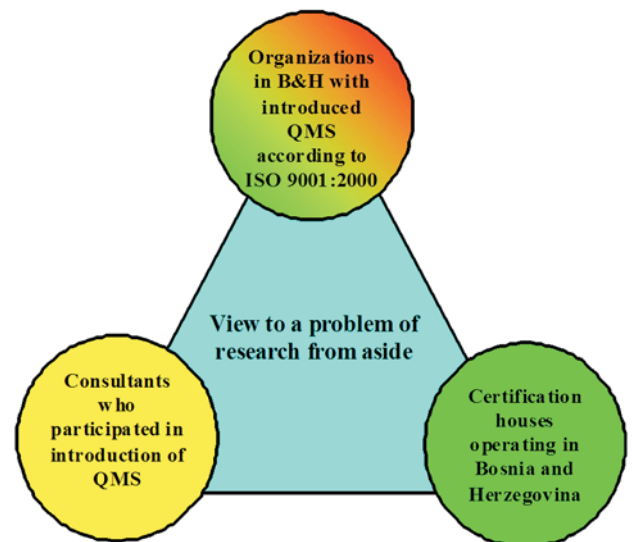


Figure 1 Overview of triangulation method used in paper [3]

#### 3.2

##### Carrying out of the information collection plan

The postal questionnaire was selected for information collection. Table 1 shows the described conduction. As for the phone and personal contacts authors limited themselves to remind and ask people to fill questionnaires and return them. In this way could be fulfilled one of the key conditions



for objectivity of research.

## 4 Representativeness of the sample

### 4.1

#### Consultants

The basic information about the sample unit, for this part of survey (the consultants), was obtained on the basis of answers to questions from the first part of the questionnaire, i.e. questionnaires for organizations, where we asked them whether they used assistance from the consultants on the occasion of introducing quality system and we asked for the name of consultants. In this way, additionally, we have some 70 names who the questionnaires for consultants were sent to. (In B&H there is still not any association gathering these people). Thirty one consultants responded to the questionnaires, which is 44,28 % of the total consultants who received questionnaires. Approximately the same amount of answers was collected through the conventional post and e-mail. It is important to note here that this survey lasted slightly longer than just a survey of organizations and that we are satisfied with a minimal statistical sample of 31 consultants. The second condition that we set is **the total number of organizations** in which consultants participated, on which occasion it was important for us to have the number as large as possible, in order to cover most of organizations which have or had introduced quality system.

**Table 1** Carrying out of the information collection plan [3]

Statistical population - for the organizations	- organizations in B&H which possess introduced QMS according to requirements of standard ISO 9001:2000
- for the consultants	- consultants who operate in the area of B&H
- for the certification houses	- certification houses which operate in the area of B&H
Unit of the sample	Individual organization, consultant and certification house
Limits of sampling - for the organizations	660 organizations from the population in B&H
- for the consultants	70 consultants
- for the certification houses	14 certification houses
Size of the sample - for the organizations	- achieved 204 units
- for the consultants	- achieved 31 units
- for the certification houses	- achieved 11 units
Procedure of sample choosing	Random sampling inside the population
Researching instrument	Structural questionnaires
Acceptance of the researched factor	Mark of the factor $\geq 3,70$
Method of information collection	Combined postal method, supported phone calls and contacts through ministries

The average age of consultants is 52,5 years, with a range from 33 to 63 years. The largest number of consultants was in the range from 40 to 60 years (22,71 %), only 3 (9,67 %) were younger than 40 years, and 6 (19,33 %) were older than 60 years.

Ten consultants out of 31 (32,3 %) are engaged in this business only (professional consultants who have mainly their own companies for consulting services), while 21 (67,7%) consultants perform consulting works on part time, i.e. parallel with other tasks where they work.

The average time of doing business for the consultants is 9,2 years, indicating that these consultants have a long time business and as for this issue they can be considered as a representative sample.

Regarding the question which standards all consultants were trained for, the 31 of them were trained for the area of quality system according to ISO 9001 standard (100 %), followed by 23 for the ISO 14000 (74 %), 11 for OHASAS 18000 (35 %), 4 for ISO 22000 (11 %), and two consultants for the ISO 27000 (6,5 %), which roughly corresponds to the number of individual certificates in Bosnia and Herzegovina, and indicates the course of development of understanding of the need for some standards in organizations in B&H, (Tab. 2).

The next three questions were related to the number of organizations in which they were consultants, and the participation of consultants in various organizations per both the size (number of employees) and activity of organization. Tab. 2 presents an overview of the participation of consultants, and the percentage of the types of organizations by number of employees and activity.

Structure by size roughly corresponds to the one that responded to the questionnaire [3]. We can note that consultants claim that there are many manufacturing and mainly manufacturing organizations certificated (two thirds versus one third of the service organizations), while the structure of responses by the organizations was 52 % service organizations and 48 % manufacturing organizations.

**Table 2** Overview of the number of participations of consultants by the types of organizations [3]

Total number of organizations which consultants worked in	993	
Average number of organizations which consultants worked in	cca 32	
Organizations sorted by the size	Up to 50 employees	55,33 %
	51-250 employees	32,33 %
	Over 250 employees	12,33 %
Organizations sorted by the activities	service organizations	33 %
	manufacturing organizations	67 %

## 4.2 Certification houses

The basic information about the sample unit, for this part of survey (certification houses), was obtained on the basis of first information that we collected during the make of database on certification organizations in B&H. We firstly had to collect information on certification houses which operate in the area of Bosnia and Herzegovina, after which we started with collection of other data. We received the confirmation of answers also from the second part of questionnaire where the organizations themselves confirmed which certification houses certified them.

At the time of research there were 14 active certification houses in Bosnia and Herzegovina, of which 11 responded to the questionnaire (78,6 %). Seven certification houses do not have their representation in Bosnia and Herzegovina,

but operate from neighboring countries, while the remaining 4 have got registered business in Bosnia and Herzegovina.

When asked about the qualification or capability, all certification houses answered that they were qualified to certificate according to the following standards: ISO 9001, ISO 14001, OHSAS 18001, one of them is not qualified for HACCP, two are not qualified for ISO 22001 and ISO 27001, and the other two are not qualified for ISO/TS 16949.

In the questions about percentage participation of organizations per size and per activity for which they were certificated, the results are as follows: Considering the size of organization, 11 certification houses answered that they had certificated 43,27 % of organizations which have up to 50 employees, 39,82 % of organizations with 51 to 250 employees, and 16,91 % of large organizations with over 250 employees. These results are almost identical with percentages of organizations which responded to the survey (where there were 42,65 % small organizations, 39,7 % middle organizations and 16,65 % large organizations).

When asked about percentage participation per activity, the organizations which were certificated by 11 certification houses were as follows: 29,91 % were service organizations and mainly service ones, and 70,09 % were manufacturing and mainly manufacturing organizations, which approximately corresponds to the results given by the consultants. This certainly shows that the number of service organizations in Bosnia and Herzegovina, which were certificated, grows daily and that it is not far when this number will be equal.

## 5 Results of the research

Before we give these results it is interesting to look at the results referring to perception of general managers, consultants and certification houses (that is their auditors) about ISO standards (series 9000) as a good system for provision of quality in organizations, and about the flexibility of this standard (ISO 9001). As seen from Fig. 2 the scores are very high which confirms the generally accepted opinion that ISO 9001:2000(2008) is a good system for provision of quality and that it is very flexible. It can also be seen that the size of score depends on the level of knowledge, i.e. understanding of given standard. By far the highest scores were given by the certification houses, i.e. their auditors of quality system who first came in touch and who are most in touch with the possibilities of this standard, and then followed by the consultants and general managers of organizations.

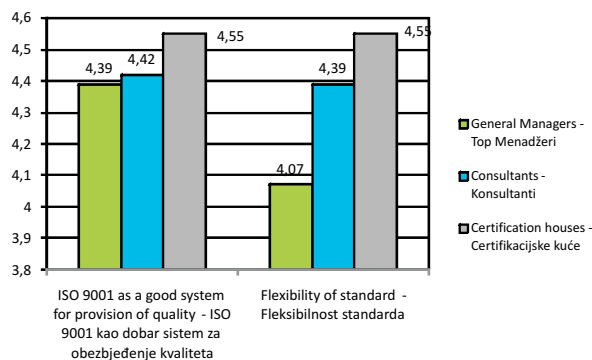


Figure 2 Parallel overview of scores of ISO 9001:2000 standard (top management – consultants – certification houses) [3]

Asked whether all the organizations where consultants took part officially obtained certificates, 23 consultants (74 %) answered with YES, and 10 consultants (26 %) answered that not all organizations have officially received the certificate.

After this, there were three questions that were imposed from the first part and through conversations that were held during the survey of organizations, i.e. objections that they gave, and referring to the connection of consultants and some certification house (where organizations claimed that there was such a strong connection), after which we asked consultants whether they were attached to some certification house, and for which one their clients opted for, that is organizations where they participated in introduction and preparation. Sixteen consultants (51,6 %) claim they are not connected to any certification house, while 15 (48,4 %) claim they are connected to some of certification houses, of which 12 gave names of certification houses (6 for TÜV SÜD, 3 for TÜV NORD, and one for TÜV ADRIA, one for LRQA and one for CRO CERT).

Eighteen consultants (58%) answered that they supported connection between a consultant and certification house (three answers with some additions: with a fair and independent relationship, with qualitative preparation and in the sense of continuing education), and thirteen consultants (42 %) answered that they did not support such connection.

When asked which certification house the organizations, in which consultants participated, opted for, the listed were all certification houses operating in the area of B&H. As for the consultants who expressed connection with some of these houses it can be seen a sequence of such connection through the certification of organization in those certification houses.

Consultants believe that manufacturing organizations pay more attention and are more dedicated to the building of quality system in 22 (71 %) of cases, in 4 cases (13 %) are the service organizations, three consultants (9,6 %) say that this is equal, while two (6,4 %) claim that this depends on the managers of organization. One of the consultants who marked manufacturing organizations underlined that those are particularly private organizations.

After the introduction of quality system and its certification there are only 2 (6,4 %) consultants who do not preserve any connection with organizations in which they were consultants, while remaining 29 (93,6 %) continue with some way of connection with those organizations. (Some consultants, five of them, gave the percentage amount 30-40 % of organizations with whom they continue some way of cooperation).

In the continuation we wanted to get answers from the consultants and certification houses about the involvement of employees and management during the introduction of quality system, and results are presented in Tab. 3. From this Table we see that the consultants considered that there was quite satisfactory participation of the employees, while slightly weaker results were given by the management. The consultants still give a very high value of 85 % for the very satisfactory and satisfactory participation of employees, while the management gives "only" 58 % of this. The only "satisfactory" answer by the consultants was that there was no unsatisfactory participation of any employees or the management.

Such greatly achieved motivation and participation of employees can only encourage the management, and can also indicate to some of the following things:

- that the employees recognized and accepted quality system as the effective system for both the achievement of quality itself and for the management in organization,
- that they accepted it as something of their own, because they actively participated in its creation, that is not imposed from the top,
- that the introduced quality system solved possible problems which they had in their work and they therefore accepted it as a good system,
- that they see it as a motivation system and opportunities to show results of their work,
- that they feel happy because someone pays attention, asks them, asks for their opinion as well as for the result,
- that they do this for pleasure, and not compelled to be implemented, etc.

**Table 3** Overview of the involvement of employees and management during the introduction of quality system – answers of consultants [3]

What was the involvement of employees during the introduction of quality system?		Answers of consultants	
		(1)	(2) /%
1.	very satisfactory	2	6,45
2.	satisfactory	24	77,45
3.	less satisfactory	5	16,10
4.	unsatisfactory	0	0
The total sample of valid responses		31	100,0
What was the involvement of management during the introduction of ISO quality?			
1.	very satisfactory	5	16,1
2.	satisfactory	13	41,95
3.	less satisfactory	13	41,95
4.	unsatisfactory	0	0
The total sample of valid responses		31	100
(1) number of valid sample units			
(2) share of valid answers (in percentages)			

Tab. 4 presents the results of certification houses about the involvement of employees and management during introduction of quality system. The area of satisfactory participation of both employees and management remained approximately at the same level. The bigger difference was noticed with employees with whom certification houses did not meet during their visits in their organizations. Very satisfactory and satisfactory participation of employees achieve high value of over 72 % given by the certification houses, while the management takes this share of 100 %. There are also satisfactory answers by certification houses that there were no unsatisfactory participation of either employees or management, and neither the less satisfactory participation of management. The opinion of certification houses on somewhat less participation of employees can also result from smaller contribution of employees in constant improvements and innovations because they were not informed enough about the quality system.

Such greatly achieved motivation and participation of the management can only encourage and can also indicate to some of the following things:

- that the management recognized and accepted quality system as an effective system for both the achievement of quality and managing in organization,
- that it is ready to show that it accepted it as something of its own, that it actively participated in its creation and

development, and thus employees do not experience it as something imposed from the top.

**Tabla 4** Overview of the involvement of employees and management during the introduction of quality system - answers of certification houses [3]

What was the involvement of employees during the introduction of quality system?		Answers of certification houses	
		(1)	(2) /%
1.	very satisfactory	1	9,09
2.	satisfactory	7	63,63
3.	less satisfactory	3	27,28
4.	unsatisfactory	0	0,00
The total sample of valid responses		11	100
What was the involvement of management during the introduction of ISO quality?			
1.	very satisfactory	4	36,37
2.	satisfactory	7	63,63
3.	less satisfactory	0	0,00
4.	unsatisfactory	0	0,00
The total sample of valid responses		11	100
(1) number of valid sample units			
(2) share of valid answers (in percentages)			

## 5.1

### Research of the factors affecting the quality

When asked about the factors that most influence the quality of products, processes and services the consultants were able to circle a number of answers. Tab. 5 presents answers to this question. From a total of 155 circled answers the consultants noticed factors which most influenced the quality of products, processes and services, in the following order:

- satisfaction of customers 16,77 %, i.e. 83,87 % of organizations of given sample (the population is 31),
- complaints by the customers 12,25 %, i.e. 61,30 % of the sample of population,
- productivity 9,67 %, i.e. 48,40 % of the sample of population,
- quality of the suppliers' services 8,39 %, i.e. 41,20 % of the sample of population,
- recognition by the customers 7,74 %, i.e. 38,70 % of the sample of population
- motivation of the employees for education 7,74 %, i.e. 38,7 % of the sample of population.

The remaining factors are in smaller percentages.

The biggest change, in relation to the answers by the organizations, was formed in productivity which the consultants gave the high 3<sup>rd</sup> place, while complaints by the customers jumped from the 4<sup>th</sup> place to the 2<sup>nd</sup> place, according to the opinion of consultants. Satisfaction of employees as a quality factor fell from the 2<sup>nd</sup> place given by the organizations to the 7<sup>th</sup> place given by the consultants. A significant decrease in the percentage also incurred by motivation of employees regarding the education, additional knowledge of employees and analysis of semi finished products (according to the opinion of consultants).

Consultants have also had the ability to write even their own affecting factors. They wrote for example: the transfer of authorization and responsibilities from the directors to



**Tabela 5** Overview of the factors affecting the quality - consultants [3]

According to your opinion, which of the listed factors most affect the quality of products, processes and services?		Answers of consultants	
		(1)	(2) /%
1.	Customers' complaints	19	12,25
2.	Customers' satisfaction	26	16,77
3.	Recognition by customers	12	7,74
4.	Write-offs as small as possible	5	3,22
5.	Productivity	15	9,67
6.	Analysis of semifinished products	1	0,64
7.	Analysis of products	8	5,16
8.	Completeness of procurement by suppliers	2	1,28
9.	Timeliness of supply	3	1,93
10.	Reliability of suppliers	12	7,74
11.	Time response from suppliers	1	0,64
12.	Quality of service from suppliers	13	8,39
13.	Tracking of quality cost	6	3,87
14.	Satisfaction of employees	10	6,45
15.	Motivation of employees for education	6	3,87
16.	Absence from work as less as possible	2	1,28
17.	Staff turnover as less as possible	4	2,57
18.	Additional education (knowledges) of employees	9	5,80
19.	Others	-	-
The total sample of valid responses		155	100,0
Share of valid answers considering the given sample		31	100,0
(1) number of valid sample units (2) share of valid answers (in percentages)			

associates, producing equipment and infrastructure, organization of processes and the profits.

When asked about the factors that most influence the quality of products, processes and services the consultants were able to circle a number of answers. Tab. 6 presents answers to this question. From a total of 61 circled answers the consultants noticed factors which most influenced the quality of products, processes and services, in the following order:

- satisfaction of customers 16,39 %, i.e. 91,09 % of organizations of given sample (sample of the population is 11),
- complaints by the customers 13,11 %, i.e. 72,72 % of the sample of population,
- recognition by the customers 9,84 %, i.e. 63,63 % of the sample of population,
- reliability of the suppliers 11,48 %, i.e. 54,54 % of the sample of population,
- quality of the suppliers' services 9,84 %, i.e. 54,54 % of the sample of population,
- productivity 8,20 %, i.e. 45,45 % of the sample of population.

The remaining factors are in smaller percentages.

The biggest change occurred in the question related to the suppliers to whom certification houses gave greater values than it was given by the consultants, while the

**Tabela 6** Overview of the factors affecting the quality – certification houses [3]

What are the factors that most influence the quality of products, processes and services to which organizations during the course of certificate pay the most attention?		Answers of certification houses	
		(1)	(2) /%
1.	Customers' complaints	8	13,11
2.	Customers' satisfaction	10	16,39
3.	Recognition by customers	6	9,84
4.	Write-offs as small as possible	0	0,00
5.	Productivity	5	8,20
6.	Analysis of semifinished products	0	0,00
7.	Analysis of products	3	4,92
8.	Completeness of procurement by suppliers	2	3,28
9.	Timeliness of supply	1	1,64
10.	Reliability of suppliers	7	11,48
11.	Time response from suppliers	2	3,28
12.	Quality of service from suppliers	6	9,84
13.	Tracking of quality cost	0	0,00
14.	Satisfaction of employees	4	6,56
15.	Motivation of employees for education	1	1,64
16.	Absence from work as less as possible	1	1,64
17.	Staff turnover as less as possible	2	3,28
18.	Additional education (knowledges) of employees	3	4,92
19.	Others	-	-
The total sample of valid responses		61	100
Share of valid answers considering the given sample		11	100,0
(1) number of valid sample units (N); (2) share of valid answers (in percentages)			

interest for education of employees was not recognized as an important factor, compared to the organizations. Satisfaction of employees as a quality factor fell from the 2<sup>nd</sup> place (by organizations) to the 7<sup>th</sup> place (by certification houses). A significant decrease in percentage occurred in additional knowledge of employees and in the analysis of semi-finished articles while the customers' complaints and productivity increased according to certification houses.

## 5.2

### Research of the achieved effects

In the next part of survey the respondents answered on the basis of the five-level Likert's scale (1 – I completely disagree; 2 – I disagree; 3 – I do not know; 4 – I agree; 5 – I completely agree). Questions were posed in the shape of statements. From the given sample of the population we calculated average value and standard deviation.

Tab. 7 present overall results by the organizations, consultants and certification houses, about achieved effects of the introduced quality system.

**Comment (results given by consultants):** As evident from Tab. 7 the introduced quality system, according to the opinions of consultants, did not affect factors related to the employees and increment of innovations. Only major

**Table 7** Overview of the influence of introduced quality system to some factors of business success – opinions of the three tested sides [3]

How did the introduction of quality system ISO 9001 affect aforementioned factors of business success in organization?		Answers given by the organizations		Answers given by the consultants		Answers given by the certif. houses	
		(1)	(2)	(1)	(2)	(1)	(2)
1.	Quality of products and services is improved	4,02	0,58	3,86	0,44	3,82	0,40
2.	Business results are improved	3,87	0,72	3,86	0,58	3,82	0,75
3.	Reputation of organization is better	4,25	0,66	4,14	0,66	4,50	0,53
4.	Number of innovation in business process is increased	3,84	0,73	3,39	0,83	3,20	0,92
5.	Processes are clearer	4,24	0,61	4,39	0,57	4,55	0,52
6.	Ordering of information system is better	4,05	0,75	3,83	0,85	3,73	0,79
7.	Satisfaction of customers is better	4,03	0,76	4,00	0,60	4,27	0,47
8.	Customers are more loyal	3,74	0,85	3,74	0,66	4,00	0,63
9.	Cooperation with customers is better	3,93	0,76	4,22	0,76	4,10	0,57
10.	Satisfaction of employees is better	3,65	0,77	3,31	0,74	3,55	0,69
11.	Atmosphere among employees is improved	3,64	0,77	3,46	0,66	3,36	0,50
12.	Mood in organization is improved	3,73	0,75	3,48	0,67	3,55	0,58
13.	Intern audits are used as a successful tool for provision of constant improvements	4,24	0,62	4,00	0,68	3,91	0,30
14.	Effectiveness and usefulness of intern audits are improved	4,11	0,62	3,90	0,77	4,09	0,54

(1) AV – Average Value; (2) SD – Standard Deviation

change, compared to the scores given by organizations, occurred in question about the increment of innovations in business process (constant improvements) which the consultants scored negatively 3,39 (<3,70) in contrast to the organizations (AV=3,84). This can partly be justified by the fact that the consultants are present mostly in the part of introduction of quality system on the occasion when constant improvement was not entrenched in the organizations themselves, but begins to act on the development of quality system in the second and third year.

As for the other answers the situation is as follows: Increment of quality of products and services was noticed by both the consultants and the organizations, with the fact that organizations (managers for quality who filled in this part of questionnaire) noticed a slightly bigger influence (score 4,02) but also slightly bigger deviation (which can be interpreted with a larger sample) compared to the consultants (AV=3,84 and SD=0,44).

"Improving business results" and "Better customers' satisfaction" were marked almost identically by both of them, with somewhat larger stretch by organizations due to the size of sample. "Clearness of the process" is somewhat better scored by consultants (AV=4,39; SD=0,57) than by organizations (AV=4,24; SD=0,61) because we believe that consultants are better informed about the process approach, and that organizations have not yet experienced benefits of this approach or do not know to use it enough. This is usually the best-rated factor and which goes in favor of the standard itself and of the process approach where the standard is based.

Arrangement of the information system is the question which received the only negative score from the entire set of questions about the factors on business success. Therefore, the score given by consultants and the stretch itself is somewhat bigger in organizations (AV=3,83; SD=0,85), but this is still a good score. This indicates that information technologies become more and more present in B&H organizations and that their usage goes towards tracking the

business results and management processes (this will certainly be more expressed upon arrival of younger staff).

Customers' loyalty is identically weaker link in both the organizations and the consultants where the influence of the introduced standard exists but in a slightly lower value. Scores are identical AV=3,74; with the fact that the stretch is somewhat bigger in organizations (SD=0,85 compared to the consultants SD=0,66). Organizations certainly have to work on this plan in the future.

Although the loyalty factor is evaluated somewhat weaker the cooperation with customers is scored very well, and especially by the consultants (AV=4,22; SD=0,76). This could point to positive and good application of standard (research of customers' wishes in the beginning, as well as the research of satisfaction in the end) but with somewhat weaker results in the scope that customers trust us and buy our product in the future as well. Certainly we should continue with this trend.

Three questions that are evaluated with "negative score" refer to "Employees' satisfaction", "Improvement of the working atmosphere" and "Improvement of the mood in organization". It can definitely be said that the introduction of quality system did not affect these factors. The consultants evaluated them as follows.

- Employees' satisfaction is better (AV=3,31; SD=0,74), which managers for quality evaluated somewhat better (AV=3,65; SD=0,77)
- Working atmosphere is better (AV=3,46; SD=0,66), which managers for quality evaluated also somewhat better (AV=3,64; SD=0,77), and
- The mood in organization is better (AV=3,48; SD=0,67), which managers for quality evaluated somewhat better and positively (AV=3,73; SD=0,75).

In the future these factors will certainly have to be given more attention because the employees are the ones who should, with their work and engagement, contribute to better quality of product and better productivity which will



increase business results and reputation in the eyes of customers.

This is also interesting because both the consultants and organizations themselves, in the ranking of factors affecting the quality, put factors referring to employees (motivation and satisfaction) to the high places.

Internal audits are used as a successful tool for providing constant improvements ( $AV=4,00$  and  $SD=0,68$ ) and their effectiveness and usability are improved ( $AV=3,90$  and  $SD=0,77$ ). Although the scores are pretty high the consultants still see a possibility to improve because the scores given by the managers for quality are somewhat bigger ( $AV=4,24$  when using the audits as a tool for constant improvements, and  $AV=4,11$  when improving effectiveness and usability of audits). Reason for this is perhaps in the fact that the times which consultants spend in organization the internal audits use it only once, while in future period the managers for quality recognize their strength as well as the ways of application for achievement of constant improvements, and thus their effectiveness as a tool at their disposal.

**Comment (results were obtained by certification houses):** As evident from Tab. 7 the only major change occurred in a question about the increment of innovations in business process (constant improvements) which the certification houses and consultants scored negatively 3,20 (less than 3,7) in contrast to the organizations. This can partly be justified by the fact that the constant improvements were not yet entrenched in the organizations themselves, but begin to act on the development of quality system in the second and third year.

As for other answers we will only turn to some of them where there were discrepancies in opinions.

The increment of quality of products and services was noticed by all, with the fact that organizations noticed a slightly bigger influence but with some bigger deviation.

According to certification houses "Reputation of the organization" is strongly increased and is the second in rank of the rated factors (by certification houses). "Clearness process" is the best rated factor by almost all, and is bigger by certification houses ( $AV=4,55$  and  $SD=0,52$ ) than in organizations themselves ( $AV=4,24$  and  $SD=0,61$ ) because we believe that certification houses are better informed in the very process approach, and that organizations have not yet experienced benefits of that approach or do not know how to use it enough. This is usually the best rated factor, which is in favor of standard itself and in favor of process approach on which the standard is based.

Three questions from the questionnaire evaluated by both the organizations and consultants with "negative score" refer to "Satisfaction of employees", "Improving the working atmosphere" and "Improvement of the mood in organization". One can definitely say that introduction of quality system did not affect these factors.

Internal audits are used as a successful tool for providing constant improvements ( $AV=3,91$  and  $SD=0,30$ ) and their effectiveness and usability are improved ( $AV=4,09$  and  $SD=0,54$ ). Although the scores are pretty high, the consultants still see a possibility to improve because the scores given by the managers for quality are somewhat bigger ( $AV=4,24$  when using the audits as a tool for constant improvements, and  $AV=4,11$  when improving effectiveness and usability of audits). Reason for this is perhaps in the fact that the times which consultants spend in organization the internal audits use it only once, while in future period the managers for quality recognize their

strength as well as the ways of application for achievement of constant improvements, and thus their effectiveness as a tool at their disposal.

## 6 Conclusions

Introduction and certification of the quality system in organizations is the process in which, besides employees in organization, the consultants and certification houses, i.e. their auditors take place.

Certainly, the first step is very important on this path, and it is set by the consultants themselves. If they properly direct management and employees in organization the quality system has got great chances to succeed and to achieve expected affects for the organization.

The consultants and certification houses who participated in preparation and certification of organizations believe that, on the basis of achieved status, the organizations are capable to use introduced quality system, i.e. that the introduced quality system will increase the most of observed effects. Unfortunately, there is still problem of so-called "soft factors" referring to the employees where introduced quality system has not yet achieved a satisfactory influence. The organizations will have to work and seek other ways to fix them, because employees are mentioned as a very important factor in achievement of quality of products and processes.

Organizations start working on the increment of a number of innovations, i.e. constant improvements usually after 2-3 years upon introduction of the system, so we could not expect that the consultants apply influence of the quality system to this factor. As for this factor the organizations will have to work on in order to improve themselves in achievement of overall results in organizations in the future.

## 7 References

- [1] Kondić, Ž. Prilagodba metodologije  $6\sigma$  malim proizvodnim organizacijama, doktorska disertacija, Fakultet strojarstva i brodogradnje Zagreb, 2008.
- [2] Russo, R. C. W. How to hire an ISO 9000 consultant, URL:<http://www.qualitydigest.com/april00/html/hire.html> (xx.06.2011).
- [3] Jašarević, S. Research of the effects of introduced quality system according to requirements of ISO 9000 standard in organizations in BiH, PhD dissertation (in bosnian), Faculty of Mechanical Engineering in Zenica, 2009.
- [4] Lagrosen, Y.; Lagrosen, S. The effects of quality management – a survey of Swedish quality professionals. // *International Journal of Operations & Production Management*, 25, 9/10(2005), pp. 940-951.
- [5] Heras, I.; Landin, G.; Casadesus, M. The impact of quality management in European companies' performance: The case of Spanish companies. // *European Business Review*, 18, 2(2006), pp. 114-131.
- [6] Magd, H. An Investigation of ISO 9000 Adoption in Saudi Arabia. // *Managerial Auditing Journal*, 21, 1(2006), pp. 132-147.
- [7] Martínez-Costa, M.; Martínez-Lorente, A. R. A triple analysis of ISO 9000 effects on company performance. // *International Journal of Productivity and Performance Management*, 56, 5/6(2007), pp. 484-499.
- [8] Toš, N. in Hafner-Fink: Metode družboslovnega raziskovanja, Ljubljana, Fakulteta za družbene vede, 1998.
- [9] Easterby-Smith, M.; Thorpe, R.; Lowe, A. Raziskovanje v managementu, Koper, Fakulteta za management, ISBN 961-6573-73-3, Koper, 2005.

- [10] Lobe, B. Združevanje kvalitativnih i kvantitativnih metod-stara praksa v novi preobleki? // Družboslovne razprave, XXII, 53(2006), pp. 55-73.

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