

# **EFFECTIVENESS'S DETERMINANTS OF QUALITY MANAGEMENT SYSTEM: AN EMPIRICAL STUDY IN SME'S ENTERPRISES EXAMPLE FROM WIELKOPOLSKA PROVINCE**

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**Key words:** quality management system (QMS), effectiveness of QMS, factors of effectiveness, QMS in Small and Medium Enterprises, problems of QMS, suitability of QMS in business activity.

## **Abstract**

Many firms have started to realize the benefits of quality management system (QMS) according to ISO 9001:2000. Also in Poland there are many certified QMS and impact on their increasing account have means from European Union supporting system's implementation in SME's enterprises. Then is a question arising, what are results of quality management system's implementing by using financial support from State. In the context of increasing account of certified QMS and above-mentioned question there were done poll research. In the following article an analysis of poll research' results (done in two stages) is carried out. The first research was done in the first quarter of 2004 year, during the project (of QMS implementing) in the analyzed group and concerned general questions according to system's implementing and running, together with way of evaluation of effectiveness and QMS efficiency. One year later, in the first quarter of 2005 year the research exploring the question of running QMS was made and factors affecting quality management system's effectiveness were analyzed.

## **DETERMINANTY SKUTECZNOŚCI SYSTEMU ZARZĄDZANIA JAKOŚCIĄ I WYNIKI BADAŃ W MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTWACH NA PRZYKŁADZIE WIELKOPOLSKI**

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**Słowa kluczowe:** system zarządzania jakością (SZJ), skuteczność systemu zarządzania jakością, czynniki wpływające na skuteczność systemu, SZJ w małych i średnich przedsiębiorstwach, problemy związane z wdrożeniem SZJ, przydatność SZJ w działalności gospodarczej.

## Abstrakt

Wiele organizacji systemowo zarządza jakością, widząc korzyści związane z wdrożeniem i funkcjonowaniem systemu wg wymagań zawartych w normie ISO 9001:2000. W Polsce, jak na całym świecie, liczba wdrażanych systemów zarządzania jakością się powiększa, dodatkowo przez programy pomocowe ze środków Unii Europejskiej. Powstaje jednakże pytanie, jaka jest „przydatność” systemów zarządzania jakością i ich funkcjonowanie w sytuacji skorzystania z dofinansowania ze strony państwa. W odniesieniu do zagadnienia przeprowadzono badania ankietowe wśród przedsiębiorstw sektora MSP, które skorzystały z dofinansowania na wdrożenie i certyfikowanie systemu zarządzania jakością. Pierwsze badanie zrealizowano w 2004 r. i dotyczyło ogólnych zagadnień związanych z wdrożeniem i efektami systemu zarządzania jakością. Badanie drugie, zrealizowane w 2005 r., dotyczyło funkcjonowania systemu zarządzania jakością i przeanalizowano również czynniki wpływające na skuteczność systemu zarządzania jakością.

## Introduction

Generally quality management system according to ISO 9001 is perceived as "world class organization" what was proved, for example in research in the north east England (PRABHU et al. 2000). Often the ISO 9001 norm is shown as the basis of TQM (WIELE VAN DER et al. 2000). It is correlated with numbers of certified quality management system in the World – over 500.000 (updated 31.12.2005). There are above 3.200 certified quality management system consistent with requirements shown in ISO 9001:2000 in Poland (*The ISO Survey...* 2003). However the national base presents even bigger amount of certified quality management systems ISO 9001:2000 – about 5000 companies (*Orgmasz...* 2005, *Hoppenstedt...* 2005). These numbers show huge interest in quality management systems, what relates to benefits of running system in a business. Therefore a multitude of publications concerning the meaning of quality management system in a business is not unjustified, especially as many of them is based on research results (TARI 2002, SANTOS 2002). There are also many articles concerning question of quality management system effectiveness (SHARMA, GADENNE 2001, CORREIA et al. 2001) and efficiency (LIN et al. 2004, MANN, KEHOE 1994), and what is connected with it also materials concerning certification impact on organization running (WIHERS, EBRAHIMPOUR 2001, GOTZAMANI, TSIOTRAS 2002). In Poland there are also many publications in above mentioned scopes, but the area of factors affecting obligatory question of quality management system – its effectiveness, is however not popularized (GRIFFIN 2004). Therefore having mentioned this gap together with author's scientific interest brought profit in the following article. Man should also point at defining general questions in the scope of the following article – effectiveness and efficiency of quality management system. Theoretically there is no problem to separate these to issues, especially with reference to quality management system, because ISO 9000:2000 norm specifies it unambiguously. Effectiveness is determined as extent to which planned activities are

realized and planned results achieved (ISO 9000:2000) and it is an obligatory component in quality management system. However efficiency, defined as relationship between the results achieved and the resources used to, is an optional issue towards quality management system's certification (ISO 9004:2000).

From above mentioned areas and analysis of quality management system's practical aspects came into being research hypotheses concerning relationships between internal factors (residing in given organization) and external factors (occurring in organization's environment) affecting system's effectiveness. Research' base was to define, that probably factors characteristic for given organization (internal) more than factors situated in organization's environment affect effectiveness of quality management system according to ISO 9001:2000.

In order to verify above mentioned, scientific presumption (hypothesis) poll research in chosen group of companies was done. In analyzed group of respondents are 79 legal entities from Wielkopolska province outstanding for the reason of achieved economic results towards other provinces.

9.3% of all businesses operating in Poland are to be found in the Wielkopolska Province. The basis of the Province's economy is the variety of industries, efficient agriculture and well-developed services, particularly in the commercial and financial sectors (Agency for Enterprise Development). This diversified economy undoubtedly contributed towards lessening the effects of the transformation process, and created favorable conditions for a market economy. After 1989, unrestrained societal activity resulted in a fast increase in the number of businesses, which currently amounts to approximately 333 thousand units, thus placing the Province third in the country. In the 500 largest companies in Poland, approximately 40 (8%) are from Wielkopolska.

In further part, after having presented research conception and used research method, follows a description of quality management system in analyzed group of companies together with next details and aspects of system approach. The most of the following points are built according to two parts. The first one is related to research from 2004 year, and the second one presents results achieved during the poll in 2005 year. However man should pay attention to different points of gravity in poll questionnaires from individual years, what will be detailed described in content.

## **Research methodology**

In the first half of year 2004 public opinion poll concerning quality management system among small and medium enterprises (SME's according to 364/2004/WE) functioning in Wielkopolska province were made. As research sample was chosen a group of organizations (only legal entities owing to database made available by Polish Agency for Enterprise Develop-

ment), that used financial support for quality management system implementing and certification. Organizations, that questionnaire were sent to, contracted subsidy for quality management system implementing and achieving a certificate, that confirms conformity between system and requirements included in ISO 9001:2000 norm. Confirmation of use of the method Data Envelopment Analysis (DEA) was literature review in the field of scientific subject matter connected with the following article (CHANG, LO 2005, CASADESUS, KARAPETROVIC 2005).

In Poland in 2003 year 807 agreements were contracted (legal entities). In Wielkopolska province 79 contracts were made and this group of legal entities made research sample in research described in the following study. Legal entities from Wielkopolska province makes 9,79% of all legal entities in Poland, that contracted subsidy for quality management system implementing and certification. Such a group of companies was selected to the research owing to research premise, that companies, that are using the financial support are very committed in the issue of quality improvement. That was a little opposing premise with relation to occurring in the polish literature opinions, that the financial support makes up the main factor of taking actions connected with quality management system's implementation and certification. In the research conception was however assumed, that analyzed organizations are committed in products quality improvement (technical quality) and customer service (work organization quality) and the financial support has to increase the economic result connected with a system's certification.

46 % of all questionnaires in research were returned (36 organizations), but the project was ended (quality management system was implemented and certified) in 16 enterprises and further analysis concerns just these organizations.

Purpose of the first research (2004) was to get information concerning:

- premises of quality management system implementing,
- requirements exclusives within the confines of quality management system,
- difficulties occurring during quality management system implementing,
- benefits from quality management system's running,
- taking action towards evaluation of quality management system's effectiveness and efficiency.

Purpose of the second research (2005) was to get information concerning:

- usefulness of quality management system in a running business,
- components affecting QMS running,
- factors of quality management system's effectiveness and efficiency.

In the second research, in 2005 year, number of returns came to 30 %, as answered 24 respondents from 79 sent poll questionnaires. Size of tested organizations was divided fifty-fifty – to small and medium companies.

## **Reasons of implementation of quality management system**

In the matter concerning quality management system in general man can point in first respect at circumstances of system's implementing. In the first research choice categories were shown to respondents on the base of analysis of the most frequent occurred in the literature (SILA, EBRAHIMPOUR 2002).

Tested enterprises pointed most often at the following premises of quality management system implementing:

- creating efficient and clear organization and management system (16,16%),
- company image improvement (12,12%),
- products and services quality raising (10,61%),
- action effectiveness increase (10,61%),
- obtaining a certificate (10,61%).

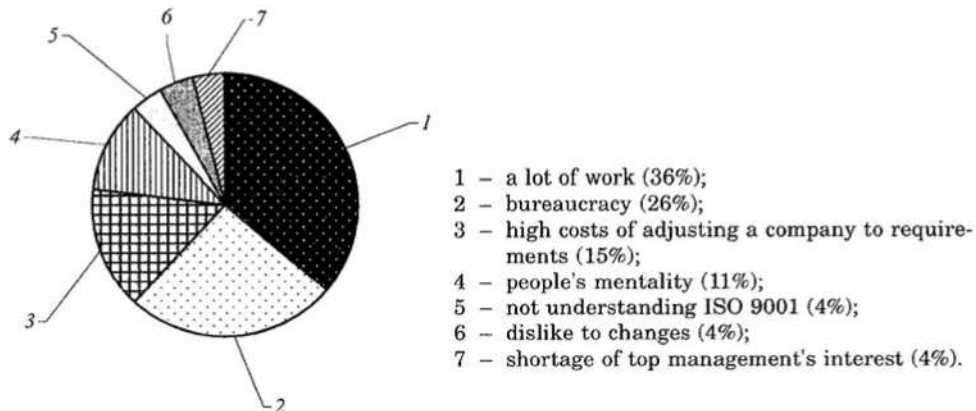
Enterprises marked in questionnaire a few premises. Research results show, that mainly putting management system in order caused quality management system implementing according to ISO 9001:2000. As second circumstance was pointed a marketing element – company image improvement.

In the research in 2005 year a question was treated as open with possibility of writing down to most important circumstances of quality management system. As most important circumstance in the second stage of research from 2005 year were pointed increase of companies competitiveness and ordering of internal organization in the company. The first circumstance concerning raising competitiveness through prestige thanks to certificate of the system common known in the world is convergent with project aim, that was financial support from State. The second circumstance is also connected with raising of companies value on the market, as internal organization affects customer service and as result also organization running on the market. Respondents choices agree with circumstances shown in the literature, however very interesting and additional is here issue of using the financial support. In the first research respondents were asked about making the project of quality management system's implementation dependant from getting financial support. Here is indicated the result for 36 answers that is all answers got from respondents (2004 research), independent from project's end that is quality management system's certification. In this group 15 organizations from 36 made implementing dependant from getting the financial support, what shows, that getting financial resources was very important circumstance of quality management system's implementing.

Man should pay attention here, that there are many reasons of quality management system's implementing presented in the literature and shown by respondents' answers, both by category choice and independent writing down, that confirm these described in the literature of the subject (CHOW-CHUA, KOMARAN 2002).

## Obstacles of quality management

Respondents, as the most important problem by quality management system implementing were pointing (in the research from 2004 year) at shortage of time to implementing action and a lot of work connected with it what is shown at figure below.



**Fig. 1.** Problems by implementation of quality management system

Source: Own elaboration.

As the second negative element connected with quality management system implementing respondents pointed at bureaucracy, and next at high costs of conforming the company to requirements. It can be noticed, that between these first two biggest obstacles exists a close connection. Bureaucracy perceived as excess of "papers" means a lot of work that is even not value-added work what concerns an obstacle most often chosen by respondents.

In the second research a question concerning problems connected with quality management system's implementing was an open question and respondents didn't choose an answer from the list. During grouping the answers it turned out, that the most important obstacle occurring during quality management system's implementing was lack of understanding of "norm's language". Interpretation and understanding of the content included in ISO 9001:2000 norm caused the company problems, what at the same time caused difficulties connected with actions' reorganization and creating system documentation. As the second essential difficulty connected with duration of quality management system's implementing concerned resistance of shift workers. An aversion to changes is an element, that was manifested in both research and it is also an essential issue met in the literature.



## **Effects of quality management**

Effects of quality management can be both positive (benefits) and negative. In the following part analyzed will be only benefits seen by respondents.

As most important external benefit from quality management system implementing is showed improvement of competitive position on the market (in the first research from 2004 year). Respondents gave this advantage worth of "definitely yes". As other external benefits tested organizations pointed:

- increase of customer satisfaction degree (rather yes),
- decrease of complaints quantity (rather yes),
- improvement of supplies quality from suppliers (rather yes),
- marketing benefits (rather yes),
- sales increase (it is difficult to say).

The most important internal advantage of quality management system's running is in respondents opinion improvement of documentation supervision (definitely yes) and "rather yes" in matter of work quality improvement, employees self-control increase, internal communication improvement.

In the research from 2005 year respondents didn't point at benefits, but at "usefulness" of individual requirements included in ISO 9001:2000 norm in a business. Respondents assessed usefulness of individual components in scale from 1 to 5, where individual values mean: 1 – not useful, 2 – rather not useful, 3 – neutral, 4 – rather useful, 5 – useful. At the same time respondents giving answers used only three categories.

As useful requirements of ISO 9001:2000 there were indicated by respondents the following components:

- control of documents,
- internal audit,
- management review.

As "rather useful" there were indicated by respondents the following requirements:

- customer satisfaction research,
- corrective and preventive action.

A neutral impact on quality management system's usefulness have in respondents opinion the following requirements:

- quality policy,
- planning of quality objectives,
- design and development.

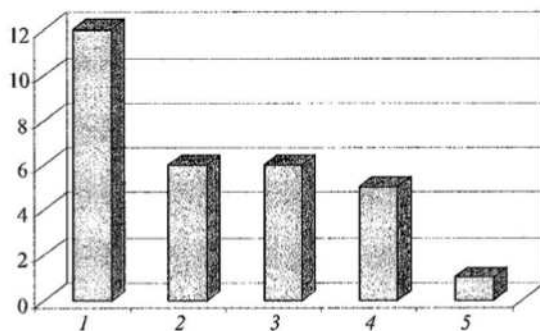
Control of documents was pointed as the most useful requirement. Control of documents is an essential issue in every activity and a question of indicating the proper requirement by respondents shows unambiguously usefulness of this requirement. Obviously control of documents should function in every organization, independent from running of quality management

system and requirements of ISO 9001:2000 norm, but as research results show this requirement affects mobilizing the employees.

### Effectiveness of quality management system

In the first research respondents were asked questions concerning evaluation method of quality management system's effectiveness. On the question if there are made analyses concerning system's effectiveness in the group of respondents, that have finished the project – 81,25% of them pointed at making such analyses. Norm ISO 9001:2000 in point 5.6 Management review shows, that top management should in planned period of time make quality management system's review in order to assess among other things its effectiveness. Within the confines of this review there are analyzed such components as: quality policy, quality objectives, results of audit, customer feedback information and status of prevention and corrective actions. Results, with reference to levels of effectiveness' evaluation, are puzzling. Only 10 of them indicated, that they make evaluation of quality management system's effectiveness. Respondents pointed also, that effectiveness evaluation relates to: work position (6 answers), organizational unit (6 answers), organizational departments (1), quality management system (12), organization (5). Three respondents didn't give an answer.

During analysis of these data man should pay attention, that data refer to all given answers, that is to 36 organizations, in this 15 that have finished the project.



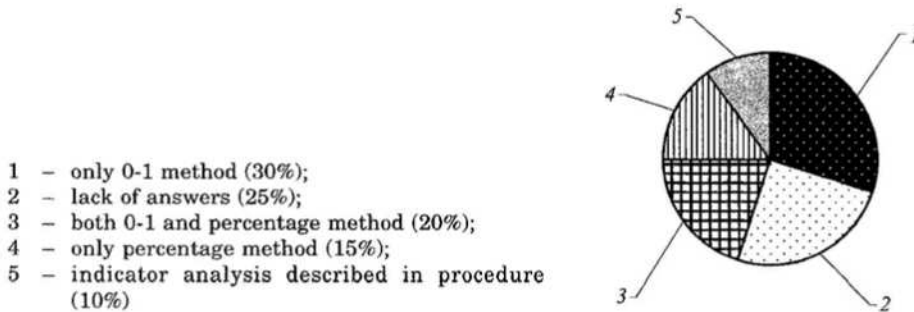
- 1 – quality management system (12 organizations);
- 2 – organizational unit (6);
- 3 – work position (6);
- 4 – organization (5);
- 5 – organizational department (1).

**Fig. 2.** Evaluation levels of quality management system's effectiveness

Source: Own elaboration



A zero-one method is the most often indicated evaluation method of quality management system's effectiveness (6 answers). Share of individual answers is illustrated by the following picture.



**Fig. 3.** Ways of making evaluation of quality management system's effectiveness.

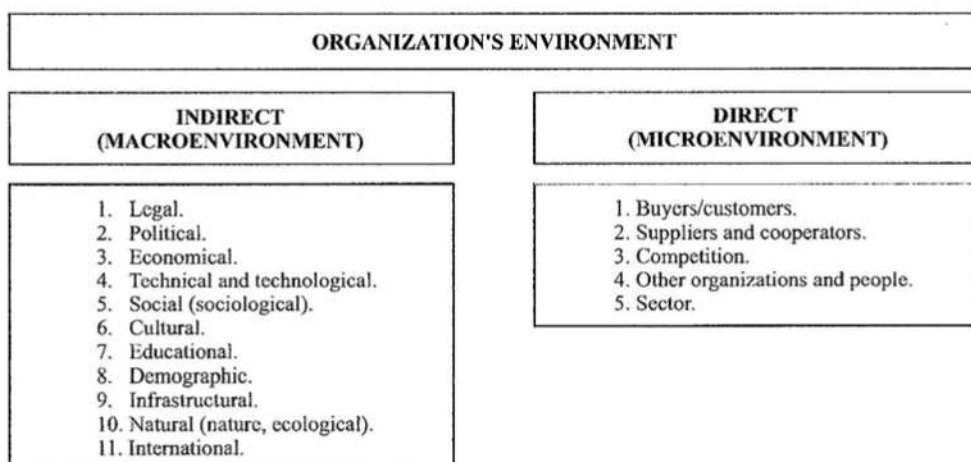
Source: Own elaboration.

Making evaluation of quality management system's effectiveness and its improvement is an obligatory element of the system, therefore research's results presented below suggest many questions. First explanation of the situation is connected with "tiredness" with poll by individual organizations and answers written down in questionnaire "on principle".

In next research, in 2005 year, issue of quality management system's effectiveness and its evaluation were not more analyzed, but an analysis was guided by factors determining both evaluation mechanism of quality management system's functioning and realization degree of planned quality objectives. Results concerning components affecting quality management system's effectiveness will be presented in further part of the article.

### **Factors affecting quality management system's effectiveness**

In the matter of factors man should pay attention, that analysis in this part refers only to results got from the second poll research. By building poll questionnaire and choosing analyzed factors the starting point was organization's environment and standard division of the factors occurring outside the organization. The basic division was presented on the following picture.



**Fig. 4.** Organization's environment  
*Source:* Own elaboration (Certo, Peter 1988).

In the research respondents grouped factors and their impact in scale from 1 to 5, where: 1 – definitely no, 2 – rather no, 3 – hard to say, 4 – rather yes, 5 – definitely yes). At the same time respondents characterized factors impact in to analyzed areas. Firstly, within the confines of general impact interesting were factors determining quality management system's effectiveness, that concerned both the stage before the implementation and already running quality management system. Detailed were shown concrete determinants of planned quality aims' realization. They were analyzed according to shown on the picture 5 division of factors.

Within the confines of general approach to the problem, as components to most extent determining effectiveness of quality management system were pointed: consulting company also shown in literature (CASADESUS, KARAPETROVIC 2005) approach and employees engagement.

Next as factors affecting effectiveness of quality management system were indicated:

- certification unit's approach,
- functioning of other management systems,
- quality management system's substantiating.

In the matter of detailed impact on quality aims' realization respondents used two categories: impact "rather positive" and "neutral". It is worth to pay attention here to answers mostly pointed. As rather positive impact there were indicated:

- customer requirements,
- competitiveness in branch,
- companies financial situation.

As neutral impact on quality aims' realization respondents showed: kind of branch (if it is production, trade or service), quality management system's substantiating, legal requirements and condition of economy. Therefore it is seen that respondents point definitely at factors connected to microenvironment, that is at elements concerning branch, where they run their business.

## **Conclusion**

Research done by article's author were carried out in to stages, at interval of one year. Results analysis of both research points at interesting problems concerning effectiveness and efficiency of quality management system.

Firstly, in spite of showing by respondents different kind of quality management system's implementing circumstances, it seems, that the important reason to take a decision about system's implementing was a possibility to use a financial support. Using public support allowed to implement a system by lower costs than in case of independent financing of the project.

Secondly, in the light of above mentioned circumstance of system's implementing, interesting seems analysis of respondents individual answers. For example, with reference to evaluation of quality management system's effectiveness, an obligatory component, it turns out, that not all analyzed organizations make such an evaluation. It seems strange, because analysis concerns certified systems, that is after assessment of fulfilling requirements included in ISO 9001:2000 norm. Comment to such situation can arise on the base of analysis of individual polls and connecting replies to different questions in one whole. Well, in connection with circumstances using consulting unit it turns out, that its representatives help by system's implementing "in the whole". At the same time certification audit focuses on content-related issues concerning fundamental sphere of the given organization's activity, omitting sphere of detailed fulfillment of typical system requirements.

Thirdly, above mentioned conclusions confirms results with reference to a question about components affecting quality management system's effectiveness. In depiction of components occurring at the stage of implementing and later running of quality management system, respondents pointed, at approach of both consulting and certification unit in connection with employees engagement during system's implementing affects its effectiveness.

Fourthly, analysis of quality management system's running was focused on factors impact according to standard division into macro and microenvironment. From respondents answers results, that definitely more impact on quality management system's implementing have micro factors than macro factors, by taking obviously internal conditions into account. It is by all

means understandable, because internal defining of aims in every organization is dependant from situation on the market, especially in direct environment as customers, suppliers and rivals.

Researches results point at these elements, that requires special attention, in order to ensure quality management system's effectiveness, that is to fulfill basic requirement connected with system's running in organization. The area to such research was specific, because connected with companies, that has already used financial support and in this way results are probably more clear than in case of analyzing of organizations, that made implementing without getting financial support. Putting together the research premises with shown above conclusions some contradiction can be thought over. It was as assumed, that analyzed companies are committed in quality problems, but results show rather, that the financial support was an important circumstance of implementing. The author thinks, that there is no discrepancy between these two elements. A matter of finances is a fundamental component in running every kind of business and doesn't contradict quality approach. However in order to be able to state this with firmness with reference to analyzed organizations it is necessary to treat the presented research as pre-study for qualitative research in the future.

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