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Quality Costs as an Element of a Management System

Koszty jakości jako element systemu zarządzania

In the conditions of market competition it is necessary to search for the instruments making it possible to achieve success, which is to a large extent related to the possibilities of providing a customer with a product on a stable level of quality.[1]

The survival and development of an enterprise is related to its possibilities to provide goods and services which are competitive in respect of their price, quality and distribution. These requirements and expectations together with legal regulations and competitiveness in the sphere of quality emphasise the necessity to produce with optimum costs but at the same level considering the customer's satisfaction. A necessary condition for the achievement of these aims is to determine and control the costs connected with quality.

The system of quality assurance and the principles of TQM philosophy are an important instrument which guarantees the fulfilment of the customer's expectations.[2] In modern management of an enterprise, constant improvement of quality is the foremost priority because the quality of a product is one of the most important tools in the fight for the customer. [3] P. Drucker said that there

[1] E. Skrzypek, *Koszty i korzyści wdrażania systemu jakości*, "Problemy Jakości" 1996, nr 7, p. 2–9.

[2] E. Skrzypek, *Wdrażanie TQM w polskich przedsiębiorstwach. Międzynarodowa konferencja "JAKOST '96"*, Ostrava, Czech Republic, Sbornik prednastek, p. 72–83.

were no efficient or inefficient enterprises, there were only enterprises with better or worse management.[4]

The process of transformation causes changes in the area of management. Any change of the conditions of the functioning of an enterprise forces the latter to have a vision, which constitutes an important instrument of strategic management. Apart from the management of production, finances, marketing, human resources, environment, an important sub-system of management is quality management, which is based on a system of quality assurance, the latter being a set of documents containing the principles and manners of behaviour comprising all the stages of the creation and the life of a product as well as all the functions and processes in an enterprise.

While discussing the problem of quality management, four basic milestones of quality management must be absolutely presented which were formulated by P. Crosby as the following questions:

- how to define quality,
- what kind of system must be applied in order to achieve quality,
- what kind of standards must be observed,
- how to measure quality.

One should be aware of the fact that there is no quality without a proper quality of management. Quality means all the characteristic properties of a product or a service in relation to marketing, construction, production and all the auxiliary processes of production as a result of which a given product or a service will satisfy the customer's expectations.[5] Quality is related to the customer and his neèds. Moreover, it should be borne in mind that there is no better or worse quality, it exists as such or it does not exist at all. Whether there is or there is not any quality is decided by the customer.

A lot of enterprises emphasise the necessity for mental reorientation towards the so-called "5 K", i.e.: customer, costs, creativity, communication and culture.

A complex management of quality means not only the complex character of production and consumption, but also integration of the interests of both the customer and the producer, which will assure greater advantages for both.[6] The

[3] E. Skrzypek, *Quality System as a Tool of TQM. Materiały Międzynarodowej Konferencji nt. Quality for European Integration*, AE, Poznań 1996.

[4] P. F. Drucker, *Innowacje i przedsiębiorczość*, PWE, Warszawa 1992, pp. 11–27.

[5] A. P. Muhlemenn, J. S. Oakland, K. G., Lockyer, *Zarządzanie. Produkcja i usługi*, Warszawa 1995, pp. 117, 118.

[6] J. Ettinger, J. Sitting, *Lepsza jakość – większe efekty*, Wyd. Naukowo-Techniczne, Warszawa 1970, pp. 149–150.

leading producers tend to be more and more conscious of the fact that the principal aim of an enterprise is not immediate gain but stability of the firm and a guarantee of liquidity.[7]

According to P. Drucker management in contemporary world refers to such issues as liquidity, productivity and future costs. Therefore, it is necessary to look for the ways of providing all these resources with the highest productivity possible.[8] In order to achieve this aim it is necessary to manage the key resources. i e. the capital, physical resources, time and knowledge in a consistent, systematic and conscious manner.[9] Productivity remains in a close relation with quality. The quality of work, resources and organisation has a direct effect on the increase of productivity of all the factors involved in the process of production. The system of quality management as an effective instrument of settling all the spheres of the activity of an enterprise is a proved instrument influencing increase of production.

The principles of productivity include the care for the order, careful management, therefore they have the key to high productivity. They include the following:

- disposing of all the unnecessary things from the place of work (serii),
- sorting out all the things at the place of work (seiton),
- cleaning everything at the place of work (seiketsu),
- keeping order and neat conditions in all the places of work (seiso),
- discipline at the place of work (shitsuke).

The Polish counterparts of 5 S are selection, systematisation, cleaning, neatness, self-discipline. These principles constitute important elements of good management and this is a fundamental basis of the practical methods of work efficiency. This leads to the achievement of proper quality of products, lowering of the costs of production, securing of the proper supply of produced goods and safety.[10]

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[7] A. Oaiman (Eindhoven), *Quality and the Producer*, Ixth EOQC Conference, Rotterdam 1965.

[8] E. Skrzypek, G. Gołubka, *Jakist a strategiczna meta w gospodarstwi. Miežđunarodna naukovo-prakticzna konferencja, Lvov 21–22 III 1996*, University of Lvov, 1996, pp. 59–62.

[9] P. F. Drucker, *Zarządzanie w czasach burzliwych*. Nowoczesność, AE Kraków, Czytelnik, 1995, pp. 9 ff.

[10] K. Sato, *Wprowadzenie do ruchu 5 S*, „Problem Jakości" 1995, No 3, pp. 33–37.

SOCIAL COSTS OF QUALITY

Quality costs in an enterprise constitute an important instrument of quality improvement and management efficiency. Quality costs come into being in the whole life cycle of a given product, so in the sphere before production, production itself and after production. Hence the following should be considered:

- quality costs borne directly by the producer,
- quality costs borne by commerce,
- quality costs borne by the user.

Calculation of the social costs makes it possible to show the scale of the problem and to enforce the activities aiming at the reduction of these costs. T. Wawak says that the social costs estimated for the year 1988 reach as much as 40% of the national revenue.[11]

QUALITY COSTS BORNE BY THE PRODUCER

In accordance with the suggestion put forward in 1967 by the Committee of Quality Costs of the American Society of Quality Control, these costs include the following groups of costs[12]

I. Costs of protective activity:

- expenditures borne by the producer in order to improve the quality of products,
- reduction of the number of rejections,
- decreasing the losses following from low quality (servicing, returns of the rejections),
- preventing the production of good of inadequate quality.

II. Costs of quality evaluation:

- costs of measurements,
- costs of other forms of quality control of raw materials, half-finished products and final products.

III. Losses following inner shortcomings, that is those which appeared in an enterprise.

[11] T. Wawak, *Rachunek kosztów jakości w układzie ciągnionym jako metoda szacowania strat powstałych w gospodarce narodowej z tytułu nieodpowiedniej jakości produkcji*, OBJWP ZETOM, Warszawa 1990.

[12] H. J. Harrington, *Poor-Quality Cost*, M. Dakker, Inc. ASQC Quality Press, New York and Basel, Milwaukee 1987.

IV. Losses following outer shortcomings, that is those which were disclosed by the customer and must be compensated for by the producer.

THE ESSENCE AND DIVISION OF QUALITY

Market orientation requires urgent and consistent following of the costs. It is a result of the strengthening of the role of the economic account and of greater competitive activities. For the society those social costs of quality are important which are borne because of a lower level of quality of home products as compared with the same products of the leading foreign producers.[13]

From the point of view of the assurance of a stable quality level in an enterprise, a very important problem is to introduce the methods and analysis of quality costs wherever it is possible.

The reasons for which quality costs appeared is the necessity to use the same language by the managers of companies who speak the language of money, and the engineers who use the language of quality and quality properties. Communication between those two groups is made possible among other things by the costs of quality. Information concerning the shape of costs in an enterprise should affect the imagination of the managerial boards and all the employees.

Quality costs fulfil the following role in an enterprise[14]:

- they constitute the basis for making strategic decisions,
- they give information referring to the degree of realisation of the system of quality control in an enterprise,
- they reflect the aim of quality control, which boils down to the choice of expenditure structure, where the sum of costs borne for quality will be the lowest,
- these are the costs borne for the achievement of proper quality of a product,
- they constitute an exceptionally important instrument of quality improvement and management efficiency,
- their use contributes to greater efficiency if the costs are introduced into the frames of proper strategies of an enterprise,

[13] R. Kolman, *Sterowanie jakością wytwarzania*, Polytechnics of Gdańsk, 1994, p. 40.

[14] E. Skrzypek, *Miejsce kosztów jakości w systemie zarządzania przedsiebiorstwem. Materiały konferencji nt. Kosztów jakości. Aspekty teoretyczne i praktyczne*, PTE, Lublin 1995, pp. 1–19.

- they affect the profit,
- they are a basic tool for the management of quality assurance in an enterprise,
- they are the most significant element of increased work efficiency,
- they are an instrument for an estimation of pro-quality activities,
- they are a useful instrument in determining the optimum quality level for a given product,
- they are an important instrument of the inner and outer management of an enterprise.

According to J. Juran, quality costs are a "gold mine". He emphasises many a times that the aim of each company should be to minimise the costs connected with low quality. He also points to the necessity to detect the sources of errors and to eliminate them. He stresses that the beginnings of the work on cost reduction are very difficult but it follows from practice that these costs show a decreasing tendency if work on finding them is undertaken. Information on the formation of quality costs in an enterprise should affect the imagination of the managers and all the employees.

A precise definition of quality costs is made harder due to the existence of a number of areas in which the activities related to quality and those closely connected with the process of production overlap.

A very important problem for the enterprise which intends to introduce a calculation of costs is to adopt their uniform classification, because it enables to eliminate heterogeneity and creates a plane of understanding between the workers from various sections, especially from the accountancy department and the department of quality assurance.

Quality costs affect the profit of the company in the following manner:

The introduction of calculation of quality costs contributes to the increase of costs of preventing defectiveness and the costs of estimation and it causes reduction of losses connected with rejections, at the same time decreasing the number of rejections. A decrease of quality costs and prime costs as a result of a calculation of quality costs contributes to a higher quality level, higher and more valuable production and greater profits.

A REVIEW OF DEFINITIONS OF QUALITY COSTS

J. M. Juran an F. M. Gryna: define quality costs as certain expenditures connected with giving the products the feature of being useful; this is a mine

which gives huge possibilities of lowering the prime costs of production.[15] Besides, F. M. Gryna introduced the notion of the user's quality costs. Here, he understood the costs borne by the buyer, the user of a means of work or a stable means of consumption. He distinguished the following groups of costs borne by the user[16]: 1) costs of repairs, 2) costs of the lost efficiency, 3) costs of the additional maintenance ability because of the anticipated rejections, 4) costs of compensations for rejections, 5) loss of profits, 6) additional investment costs in relation to competitive products, 7) additional exploitation and maintenance costs in relation to competitive products.

J. M. Juran is of the opinion that quality costs include[17]:

a) prevention costs including: administration of quality control, engineering of quality control, quality planning, training.

b) estimation costs including: control, research, control of supplies, control of measurement devices, used materials, audit.

c) costs of inner rejections including: irreparable rejections, repairs, corrections, losses in supplies, analysis of rejections.

d) costs of outer rejections including: rejections from production, technologies, servicing costs, analysis of rejections.

F. Nixon treats quality costs as the expenditures borne or profits lost following from imperfect activities.[18]

B. Oyrzanowski defined quality costs as a method of quality control and he distinguished the costs borne for[19]: achievement of a definite quality level, analysis of costs connected with the achievement of a definite quality level, activity aiming at reduction of quality costs in an enterprise.

According to EOQC, quality costs are those expenditures which are borne for or connected with the control of products of a set standard of quality. Quality costs are those costs which appear mostly due to quality requirements, i.e. these are the costs of all the undertakings connected with defect prevention, with quality control as well as all outer and inner costs of defectiveness.

According to Danish solutions, quality costs include the following: costs of prevention, costs of estimation, costs of inner and outer losses.

[15] J. M. Juran, F. M. Gryna, *Jakość, projektowanie, analiza*, PWE, Warszawa 1989, p. 69.

[16] F. M. Gryna, *Koszty jakości po obu stronach bariery*, "Problemy Jakości" 1978, No 2.

[17] J. M. Juran, *Quality Control Handbook*, Mc Graw Hill Book Company, New York–Toronto–London 1974

[18] F. Nixon, *Jakość i niezawodność a zarządzanie przedsiębiorstwem*, PWE, Warszawa 1974, p. 38.

[19] B. Oyrzanowski, *Koszty jakości. Mała Encyklopedia Jakości*, PWE, Warszawa 1984.

R. Schroeder distinguishes quality costs including: costs of control (prevention and estimation), costs of damages (inner and outer).[20]

A simpler definition of quality costs is adopted in Sweden, where these include those groups of costs which are related to the work connected with providing a given product with the proper and adequate quality. A review of literature allows us to state that costs are distinguished into those of: consistence, inconsistency, lost chances.

Besides, quality costs are also divided into those of:

1) the supplier: inner, outer, of estimation and of prevention.

2) the customer: exploitation of a product, repairs, removing defects, liquidation, using the environment.

3) social costs referring to law costs, insurance of defects, removing low quality products, costs of the consequences of complaints.

The aim of each company should be to strive at greater efficiency. According to P. Drucker[21], efficiency is something of supreme importance for man's development, development of organisation and self realisation as well as the ability of contemporary society to survive. He emphasises that efficiency can be learned. The calculation and analysis of quality costs are an important instrument in an estimation of the efficiency of a system of quality assurance.

QUALITY COSTS IN THE LIGHT OF NORMATIVE SOLUTIONS

The problems of quality costs are dealt with in point 6 of the norm ISO 9004 "Quality Management and the Elements of a Quality System. Guiding Principles. Point 6 is entitled "Economic Factors – Costs Connected with Quality". A calculation of quality costs was univocally considered as an important element of a quality management system. It follows from this norm that the analysis of quality costs should be carried out from the point of view of an enterprise and a customer. If the costs are considered from the point of view of the enterprise, then those costs which follow from mistakes in marketing and planning should be taken into consideration including those connected with: the use of improper materials, alterations, servicing, exchanges, production losses, servicing at the place where a given product was fixed.

[20] R. C. Schroeder, *Operations Management. Decision Making in the Operations Function*, Fourth Edition, Mc Graw Hill, Inc. 1993, p. 759.

[21] P. F. Drucker, *Menedżer skuteczny*, "Nowoczesność", AE Kraków, Czytelnik 1994, p. 85.

Considering the point of view of the customer the following should be taken into account: safety, costs of purchase, costs of exploitation, costs of service, costs of repairs, costs following from the time when the product cannot be used, costs connected with liquidation of the product.

The norm emphasises that if the problem is viewed in a longer period of time, the effect of quality on the balance of gains and losses can be significant. However, it is important that the estimation of the quality system efficiency should be carried out from the point of view of economic effects. The norm of ISO 9004 divides costs into:

1) operation costs borne by the enterprise for the achievement and assurance of definite levels of quality including:

- costs of prevention and estimation (or investment): costs of activities whose aim is to prevent damage, costs of research and control conducted in order to check if definite quality is maintained,
- costs of damages or losses, including damages prior to the supply, e.g. costs of a repeated service, repeated production, examination, costs of scraping, and damages after the supply, e.g. servicing, guarantees, returns, costs of legal responsibility.

2) costs of outer assurance of quality connected with presentation and proofs demanded by the customers as objective proofs of quality. These include a certificate of a system of quality control, certificates of independent estimation of a product. This group of costs include the following: costs of detailed and additional quality control, costs of procedures, data, displays and estimations, for example costs of examining special characteristics of safety by recognised and independent research units.

The norm does not define the criteria which constitute the basis for a division of quality costs. It means that each producer is able to establish his own criteria of quality costs division and to determine the principles of their documentation.

There is a necessity for a systematic transfer of information related to the costs to the managing board of the enterprise in order to:

- estimate the adequacy and efficiency of the quality management system,
- establish the areas of the creation of costs, which should be submitted to analysis,
- establish the goals referring to improvement the quality and to optimise the costs.

Quality requirements influence a considerable part of recorded and processed costs within the calculation of costs with the enterprise. It is not, however, possible to view all the costs which are in any way bound up with quality as

quality costs. The point is rather to determine which costs are indispensable to assure the required quality in an economical way. The division of costs presented here proved correct in a number of enterprises, independent of the size of the enterprise, the realised production program or production organisation.

According to French solutions, quality costs comprise the following:

1. costs of quality achievement including: costs of prevention, costs of detection and pricing, costs following from keeping the conditions of agreement, outer costs following from not keeping the agreement conditions.
2. costs inconsistent with quality or costs which do not refer to quality.

QUALITY COSTS ACCORDING TO NORM PN-ISO 9004-1

The amended norm points to three approaches to financial accountancy of the activities connected with the quality system and distinguishes: quality costs, process costs, quality loss.

Quality costs include the costs of inner operations analysed according to the model of prevention – estimation – damage. Quality costs comprise the following elements: prevention, estimation, examination, control, checking the fulfilment of quality requirements, inner damages including the costs following from unfulfilment of quality requirements by the product before the supply, e.g. alteration, outer damages due to unfulfilment of quality requirements by the product after its delivery.

Process costs comprise two groups of costs: compliance costs, that is the fulfilment of all the determined and assumed needs of the customer with simultaneous lack of any damage of a given process, cost of a lack of compliance caused by the wrong course of a given process.

Quality losses comprise the inner and outer losses because of inadequate quality including: immeasurable outer losses that is the customer's dissatisfaction, immeasurable inner losses caused by lower work efficiency connected with corrections, measurable losses that is the costs of the defects found inside and outside of the organisation.

QUALITY COSTS CALCULATION

A calculation of quality costs is a part of the management system of the enterprise, that is management in the sphere of quality based on determination of

quality costs, their analysis, determination of the sources of those costs and planning their removal by means of a number of undertakings the costs of which must be lower that the value of the saving achieved in this way.[22]

A calculation of quality costs is a system of viewing all the costs connected with production quality in proper sections, carrying out an analysis of those costs together with undertaking activities for the improvement of quality and reduction of production costs. It should be emphasised that the literature of the subject interchangeably uses the terms of quality costs and a calculation of quality costs.

The purpose of the cost calculation is to determine the tasks which should lead to a reduction of production costs with the same or increased level of quality. This calculation should be carried out with the involvement of experts of quality and accountancy. A far reaching co-operation and understanding is necessary in this respect. A system of quality costs should serve the fulfilment of a number of tasks including the following: being helpful in the establishment of quality policy, creation of possibilities of following the quality of products from the point of view of the formation of quality costs, beginning with research work and ending with the customer's using the product, pointing to the "weak quality points" in the product and in the process, in accordance with quality priorities, determining the undertakings leading to a reduction of costs and to quality improvement, creation of possibilities of quality planning considering the costs together with an analysis of the value, providing the data to quality reports for the managerial board of an enterprise, aiming at disclosing the overestimated quality costs which appear as a result of adopting the wrong quality criteria which are not required by the market.

The system of quality costs does not constitute parallel accountancy in relation to the cost calculation in the enterprise. Besides a calculation of costs there must exist an efficient system of registering the data of the enterprise, which is necessary for contract realisation. The introduction of a system of costs can eventually lead to success if it is actively supported by the managerial board of the enterprise. Reports of quality costs are little known in general accountancy and one should not expect there any initiative whose aim would be to introduce such a system.

Quality costs must provide information which is of principal importance for quality policy and for particular problems connected with quality. The managers of the enterprise should make use of this information for an estimation of

[22] *Mała encyklopedia jakości*, ed. by B. Oyrzanowski, PTE, Warszawa 1984.

their own decisions, because only then work expenditures on registering the quality costs can be justifed.

The system of quality costs can fulfil its functions if the following conditions are satisfied:

- registration of quality costs will be organised and realised in accordance with economic principles, which means that accuracy of determination of costs must be in proper relation to the importance of the obtained conclusions,
- the costs calculated by the accountancy of the enterprise must be up-to-date and clear,
- causes of the quality costs must be shown in an analysis of costs,
- for a better estimation of quality costs, the analysis must take into consideration not only absolute costs but also indexes of quality costs,
- reports of quality costs must be prepared in such a way that they should present changes of costs in time; this is especially important from the point of view of the efficiency of undertakings whose aim is to assure quality.

An analysis of quality costs performed only once is useful for the estimation of the amount of costs but it is of little importance for the assurance of quality. It is necessary to plan quality. It can be done on the basis of the data from the past, the planned production and the anticipated changes in the production process. Planning these changes is made by the section of quality and accountancy of the enterprise.

Registration and processing of quality costs and the information connected with it is made with the help of the system of data registration in the enterprise. This information includes: positions of costs, carriers of costs, causes of costs, kinds of defects, suppliers, machines, tools, measuring-controlling devices.

Quality costs are calculated by the accountancy and they are transferred to the section of quality and others within the enterprise. Costs registration is usually performed by the accountancy or controlling section of the enterprise.

An essential problem in quality costs calculation is to determine the places of costs formation in such a way that the costs are not recorded according to the place where they were disclosed but where they actually appeared. Important prerequisites which should be taken into consideration while determining the places of recording the quality costs are the economical principle and the necessary amount of information.

According to T. Wawak the number of these placed is affected by[23]:

[23] T. Wawak, *Koszty i korzyści wdrażania systemu jakości w przedsiębiorstwie*, ed. by T. Wawak, PKN, Warszawa 1996.

- the size of the enterprise,
- organisational structure,
- degree of decentralisation and financial independence of an organisational unit,
- the relation with the suppliers and customers,
- requirements of the customers,
- requirements of the introduced system of management and quality control,
- the adopted plan of accounts and the way of clearing the accounts of the budget organisational units.

STAGES IN INTRODUCING A CALCULATION OF QUALITY COSTS[24]

1. Preparation of information materials which constitute the basis for decisions made by the managers of an enterprise about the introduction of a calculation of quality costs.

2. Establishment of a team directing the processes of introduction and methodology of a calculation of quality costs adjusted to the specific character of the enterprise, including the scope of the calculation (kinds of costs), documentation system, balance and non-balance accounts, a system of data processing, the scope of utilising the costs analysis.

3. Preparation of a detailed instruction of introducing a calculation of quality costs (documentation, analysis, conclusions, presentation of results).

4. Issuing instructions by the company's director about the introduction of a calculation of quality costs and the procedures connected with it.

5. Training of the staff in the sphere of quality costs.

6. Keeping documentation and making a costs analysis with the aim of:

– estimating the level of quality costs in time and space in the scheme of particular groups,

– kinds, positions of quality costs according to the places of discovering those costs and their appearance as well as in other sections,

– determining the effect of costs connected with quality on the shape of the total cost and the absolute profit,

[24] *Rachunek kosztów jakości – poradnik dla przedsiębiorstw przemysłowych,* OBJWP ZETOM, Warszawa 1989.

– determining the optimum level of quality of the products, i.e. the level which will assure the maximum amount of profit in a long term and profitability in a short term,

7. Presentation of information about quality costs to the managers of the company and the organisational units which are concerned about the problems of quality costs.

8. Utilising the conclusions following from the analysis of quality costs in working out and verifying the annual or many-years' program of quality improvement and in making current decisions. This program should point to the directions and the list of suggested undertakings and the manners of using them.

THE ANALYSIS OF QUALITY COSTS

An important part of the reports about quality costs is constituted by an analysis of quality costs, which makes a comparison of the planned and real states, shows the trends and analyses the causes of the appearance of costs.

In order to guarantee uniform principles according to which the system of quality costs will be realised, the company's managers would work out directions concerning quality costs in the following scopes: the scope of binding in the sense of the area, competencies and responsibility, time of introduction, procedure of changes, documentation, definitions of elements of quality costs, registration of quality costs and assigning quality costs, pointing to quality costs.

It should be emphasised that documentation, grouping and analysis of quality costs must be consistent with the needs and expectations of a definite enterprise. The aim of introducing a calculation of costs is to have up-to-date, complete and reliable information about the costs. The introduction of an analysis of quality costs in the system of management has the following functions:

a) creates chances for increasing the efficiency of a system of quality control and increasing the customer's trust,

b) measurement of quality costs and publishing the results is a continuous information process which constitutes the basis for undertaking proper activities by the managers,

c) conducting an analysis of quality costs one should consider not only the producer's costs but also the costs borne by the user; it is also necessary to take into account the type of thinking represented by our customer.

The aim of the analysis of quality costs is:

- to determine the position of costs which can be reduced or liquidated,
- to determine the undertakings and means which should serve realisation of tasks,
- to consider the interests of the producer and the customer,
- to determine the degree in which increased expenditures on prevention activity affects lower losses,
- to estimate the level of costs in the structure of particular groups and positions of costs,
- to determine quality costs on the shape of the financial result.

The aim of the analysis of quality costs according to J. Juran is:

- identification of all kinds of activities leading to the desired quality,
- determination of costs of the enumerated activities,
- interpretation of the obtained information which is open to all those who are concerned,
- searching for the possibilities of optimisation of quality costs,
- organisation of current observation and registration of trends for quality costs.

The cost analysis makes it possible to:

- ❖ lower general costs,
- ❖ increase the profit and the added value,
- ❖ increase the customer's confidence because they are not burdened with the costs of a lack of quality,
- ❖ provide the managers with significant numerical data which are the basis for decision making,
- ❖ focus on the most important matters,
- ❖ undertake prevention activities,
- ❖ make the managers of all levels and all the workers aware of the financial effects of their activities,
- ❖ give a reliable estimation of the system of quality control from the point of view of economic effects,
- ❖ create the basis for the programs of costs reduction and permanent improvement.

THE WAYS OF VERIFYING THE EFFICIENCY OF A SYSTEM OF QUALITY CONTROL IN AN ENTERPRISE

Decision of introducing a system of quality assurance in an enterprise is determined by business factors. One expects an increased efficiency of our acti-

vities. An increased level of quality is the cheapest way leading to improved economic effects of the enterprise. Treating quality as a priority of the enterprise provides a chance for success in the conditions of a competitive market. Quality is what can be improved. In this view, quality is never the fulfilment of the customer's expectations but it is the aim of continuous attempts. This approach comes from a Chinese philosopher, Lao Tsu, who in his work Tea TE Cing defined quality as an ideal with no defects, which should be aimed at but which is never to be achieved. A defect is what would never occur if everything were ideal. This definition is considered as the basis for the estimation of quality costs.

A calculation and analysis of quality costs is an important instrument for the estimation of an efficient system of quality control. According to P. Drucker, efficiency is something of key character for man's development, for the development of an organisation but also for self development and the ability of modern society to survive. He emphasises that efficiency can and must be learned.[25]

Among the many instruments which are a condition of survival on the market, one should distinguish a proper system of calculation and analysis of quality costs. A calculation of quality costs and all the pro-quality activity are the processes which require constant attention and systematic actions. A calculation of quality costs is an important instrument which comprises documentation of costs, estimation of the optimum level of a product's quality and an offer of undertakings which should aim at the achievement of an optimum level of quality, which shapes participation in the market and efficiency of management. It is more and more often stressed that competing by means of quality is sensible if it is possible to measure the costs of quality in an enterprise if only approximately.

A lot of enterprises, not only Polish ones, lack the consciousness of the height of quality costs which are borne by the whole organisation and of their size in relation to particular articles. In many cases, the system of cost documentation is not submitted to the aims of quality management which must become the strategic aim of the company functioning in a competitive environment. Quality costs constitute an important instrument of improvement of quality and management efficiency; they provide information about the degree of realisation of a system of quality control in an enterprise. Correctly conducted calculation of quality costs establishes the effects, prices, it enables to control the enterprise, it constitutes the basis for making economic decisions. An increase of

[25] Drucker, *op. cit.*, p. 85.

the quality level of products and searching for the sources of reducing the costs require solving a number of complex problems in an enterprise, including identification of problems understood as areas of high quality costs.[26]

The use of a calculation of costs will be more effective when quality costs are introduced into the frameworks of proper strategies and when they are supported by proper human resources involved in the process and procedures of documentation and analysis of quality costs. This requires[27]: full involvement of the managers and working out the procedures of quality costs in the areas of:

- designing,
- preparation,
- introduction,
- maintaining of the process of identification,
- reporting and analysis of quality costs,
- establishing the working teams for the matters of quality costs,
- constant training,
- increasing the consciousness concerning quality costs,
- participation in cost reduction.

TQM IN RELATION TO QUALITY COSTS

The problem of quality costs should be viewed in the context of complex quality management.[28] In the Polish literature TQM does not have a distinct translation; it is rendered as management through quality, management with total quality or pro-quality management. Quality management refers to the methods which are known in the management theory such as management through the aims.[29]

TQM is a manner of management which improves: efficiency, flexibility, competitiveness of an organisation as a whole.[30]

[26] E. Skrzypek, L. Czternastek, *Koszty jakości. Aspekty teoretyczne i praktyczne*, PTE, Lublin 1995, pp. 5–71.

[27] E. Skrzypek, *Koszty jakości jako narzędzie weryfikacji skuteczności systemu zapewnienia jakości w przedsiębiorstwie* [in:] *Koszty i korzyści wdrażania systemu jakości w przedsiębiorstwie. Międzynarodowe Sympozjum Aplikacyjne ISO 9000 FORUM*, PKN Warszawa 1996, pp. 20–35.

[28] E. Skrzypek, *The Strategy of Complex Quality Management in the Conditions of a Competitive Market*, UMCS 1994, s. H, vol. 28, pp. 209–226.

[29] E. Kindlarski, *Zarządzanie przez jakość w Japonii i USA*, "Organizacja i Kierowanie" 1991, No 4.

[30] Muhlemann, Oakland, Lockyer, *op. cit.*, pp. 130–131.

According to the same source complex quality management includes: cultural and communication aspects, documentation of a system of quality management, statistical control of processes, group effort for the benefit of quality improvement. All those elements complement each other and they are subjected to non-conditional engagement in the problem of quality on the part of all the workers independent of their sphere of activity, be it marketing, finances, trade, designing, accountancy, supply, staff management, information, production, distribution or research.[31]

A quality system is an instrument in realisation of TQM principles in an enterprise.[32]TQM system makes it possible for the employees to undertake attempts to eliminate wastefulness through focusing on reducing the quality costs. Understanding the essence and causes of those costs enables to undertake measures counteracting their appearance.[33]

In the system of TQM an attempt was made to determine the total quality cost which is the sum of: costs of compliance, including prevention of errors and production of low quality products which appear before the errors are made, costs of a lack of compliance, including the costs of error correction and liquidation of low quality products appearing after the errors are made.

TQM distinguishes the following kinds of costs[34]:

1) costs of compliance include: costs of prevention, costs of control and inspection;

2) costs of a lack of compliance: costs of repairing the inner and outer defects, costs of production surplus, rejected products, matters under court trial;

3) costs of lost chances: profits which were not achieved because of producing and selling low quality products, because the production property was not utilised due to the production of goods of low quality.

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[31] E. Skrzypek, K. Szczepańska, *Motivation in Quality Management as a Factor of Market Success*, Ann. Univ. Mariae Curie-Skłodowska, in print.

[32] E. Skrzypek, *Wdrażanie TQM w polskich przedsiębiorstwach. Międzynarodowa konferencja naukowa "Jakost '96"*, Ostrava, Czech Republic, Sbornik prednastek 1996, pp. 72–83.

[33] E. Skrzypek, *Koszty jakości jako element systemu sterowania jakością w przedsiębiorstwie. Collective work* [in:] ed. by W. Grzybowski, *Przedsiębiorczość w teorii i praktyce gospodarczej*, ed. by UMCS, Lublin 1995, pp. 99–112.

[34] T. Wawak, *Zarządzanie przez jakość*, Wyd. Informacji Ekonomicznej, Kraków 1995, pp. 42–43.

STRESZCZENIE

W artykule przedstawiono istotę, rolę i miejsce kosztów jakości w systemie zarządzania w przedsiębiorstwie. Jakość postrzegana jest jako ważny instrument biznesu. W nowoczesnym zarządzaniu ciagłe doskonalenie jakości staje się najważniejszym priorytetem, bo jakość wyrobu stanowi podstawowe narzędzie walki o klienta. Wskazano, że nie ma jakości bez odpowiedniej jakości zarządzania, zaś zarządzanie odnosi się do płynności, produktywności oraz kosztów w przedsiebiorstwie. Podkreślono rosnące znaczenie związków pomiędzy jakością i produktywnością w warunkach konkurencyjnego rynku.

Koszty stanowią ważny instrument poprawy jakości i wzrostu efektywności gospodarowania, szczególną uwagę zwrócono na społeczne koszty jakości. Dokonano przeglądu definicji kosztów jakości spotykanych w literaturze, a także w aktach normatywnych. Przedstawiono ponadto istotę i znaczenie kosztów jakości wskazując, że wprowadzenie systemu kosztów tworzy szanse na sukces tylko wówczas, gdy będzie on aktywnie wspierany przez kierownictwo przedsiębiorstwa. Zaproponowano schemat procedury analizy kosztów jakości. Artykuł zawiera ponadto prezentację sposobów weryfikacji skuteczności systemu zapewnienia jakości z wykorzystaniem kosztów jakości oraz wskazuje miejsce kosztów jakości w kompleksowym zarządzaniu jakością w przedsiębiorstwie.