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Economic Aspects of Company Processes Improvement

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Abstract

The following article presents issues of precise estimating of process cost using the method of cost account based on Activity Based Costing. The general question is why traditional cost calculation methods are not exact enough to determine the process cost of contemporary production processes and what solutions may be proposed to increase the accuracy of calculations. The article not only focuses on the limitations of traditional methods of the process costing and cost objects calculation but also points out the procedure of activity cost assignment including both indirect and direct costs. The described conception is presented especially in the context of processes improvement in organizations. Moreover, the advantages of proposed solutions and limitations of their implementation in manufacturing practice are shown.

Keywords: Activity Based Costing (ABC); process costing; activity cost assignment; cost calculation; process improvement

1. Introduction

The issue of cost account attracts broad interest recently. The rapidly changing environment and complexity of manufacturing processes require such systems and solutions for cost account that would provide fast and reliable information. Traditional systems of cost account are not always able to meet the managerial decision-making needs. That is why the enterprises strive for modern concepts of cost account which become the strategic need of business organization nowadays.

The range of cost account changes along with the managers' need for appropriate information applied in the company management.

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One of the key factors of the manufacturing process analysis is determining the production prime costs of the product and its components. This is done using cots account called cost calculation which determines the unit cost of manufactured products as well as products in progress along with establishing the cost structure in the calculating arrangement.

The use of appropriate calculating methods depends on the production type and the need of exact calculations. For instance in case of unit or job-lot production, when there might be the problem with calculating indirect costs, there is a need for very accurate calculations. New methods of calculation of production cost develop due to the increase of advanced production techniques, the complexity of manufacturing processes, increasing cooperative links, growing diversity of the final goods, development of information systems and the increasing needs of precise calculations. Together with development of these methods the share of indirect costs in the prime cost of products, defined by surcharge is falling [1].

Apart from the accurate defining of the production and services cost the need for acquiring precise data on the course of individual stages of manufacturing goods or service arises. The traditional methods of cost account do not allow to determine the costs of processes which makes impossible to determine fully the effectiveness of actions carried out. Therefore it is essential to search for solutions (such as quality costing or logistics) enabling reliable managing the costs of processes within a company.

2. The development and key features of Activity Based Costing

The traditional and most common methods of cost account include division calculation and additional calculation widely characterized in the literature on the subject [1, 2, 3, 4, 5]. Each one has many varieties.

Reviewing the division and additional methods of cost account one may come into conclusion that there is no single best method of determining the unit cost of production. A number of different methods of production cost calculation have been developed. They serve specific purposes depending on the business profile and what is associated with it namely the output rate, degree of production automation, the computer system in the company etc.

The development of new cost account methods entails higher cost and workload essential to perform calculations. However, particularly in the case of unit and job-lot production most division and additional methods are less accurate which forces the company to look for calculation algorithms which would be as precise as possible. It should be underlined that on the one hand, managers have to pay attention to precision and the effects of implemented methods. On the other hand, they should focus on the costs and necessary changes associated with this implementation.

The division and additional methods, in the face of current trends of development of market economy, are not able to fulfil the information demands of the company management. The development of competition has contributed to changes in the technology, automation of manufacturing processes. It has expanded the range of products offered by the company and shortened their life cycle. This all have led to changes in the structure of the company costs. The costs of direct materials and direct labour have decreased in total company costs. In the past, this share amounted to 50% and 35% of all company costs, whereas at present it oscillates between 45% and 10%. The indirect costs have increased significantly from only 15% to 45% of company costs (in extreme cases even to 80-90%) [1, 4].

The traditional activity costing systems are based on one or two arbitrary principles of cost assignment – these are generally the direct wages, man-hours or machine-hours (Fig. 1). Such calculation procedure was efficient in case of low indirect costs. In this case there were only slight deviations between calculated and actual costs. The high level of indirect costs and their incorrect calculation provides irrelevant and misleading information. This leads to making wrong decisions [6]. The most common mistake is underestimating the unit costs of small series produced goods or custom made products and revaluation the manufacturing costs of mass production [1]. That is why goods or services generate looses although calculation shows profitability [7].

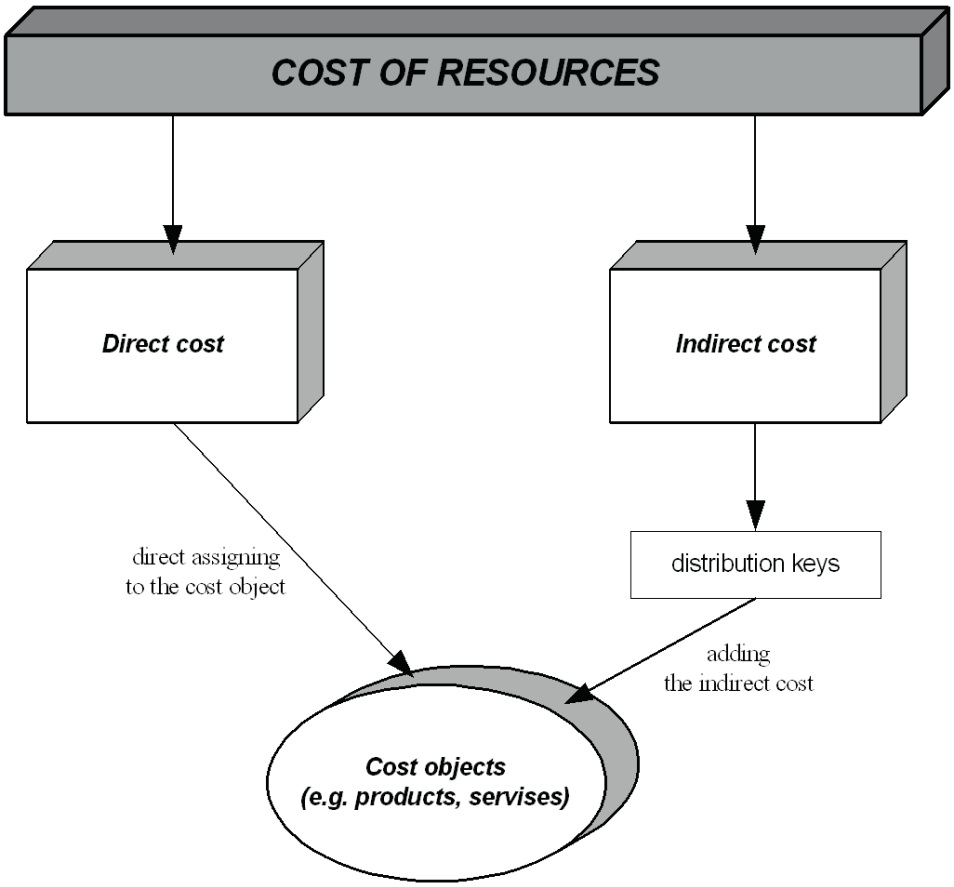

Fig. 1. Traditional cost calculation.

The need for obtaining accurate data on the individual stages of the manufacturing process arises as well. This was not possible in previous calculations [8].

According to the concept of Activity Based Costing (ABC) the prime cost of manufacturing a given product is equal to the sum of direct costs and all activity costs associated with its production [9]. Activity Based Costing omits the direct costs defined by means of surcharges and calculates them using different bases, which generally are not proportional to the production volume. In Activity Based Costing costs collected by entities must be included in the cross-action and then in the review of cost objects (of goods and services) (Fig. 2) [8].

The key targets of Activity Based Costing are the following [10]:

- Realignment of activity costing of produced goods and reduction of wrong decisions connected with these costs
- Improving the accuracy of measurements of the enterprise resource consumption
- Increasing cost transparency incurred in various company activities

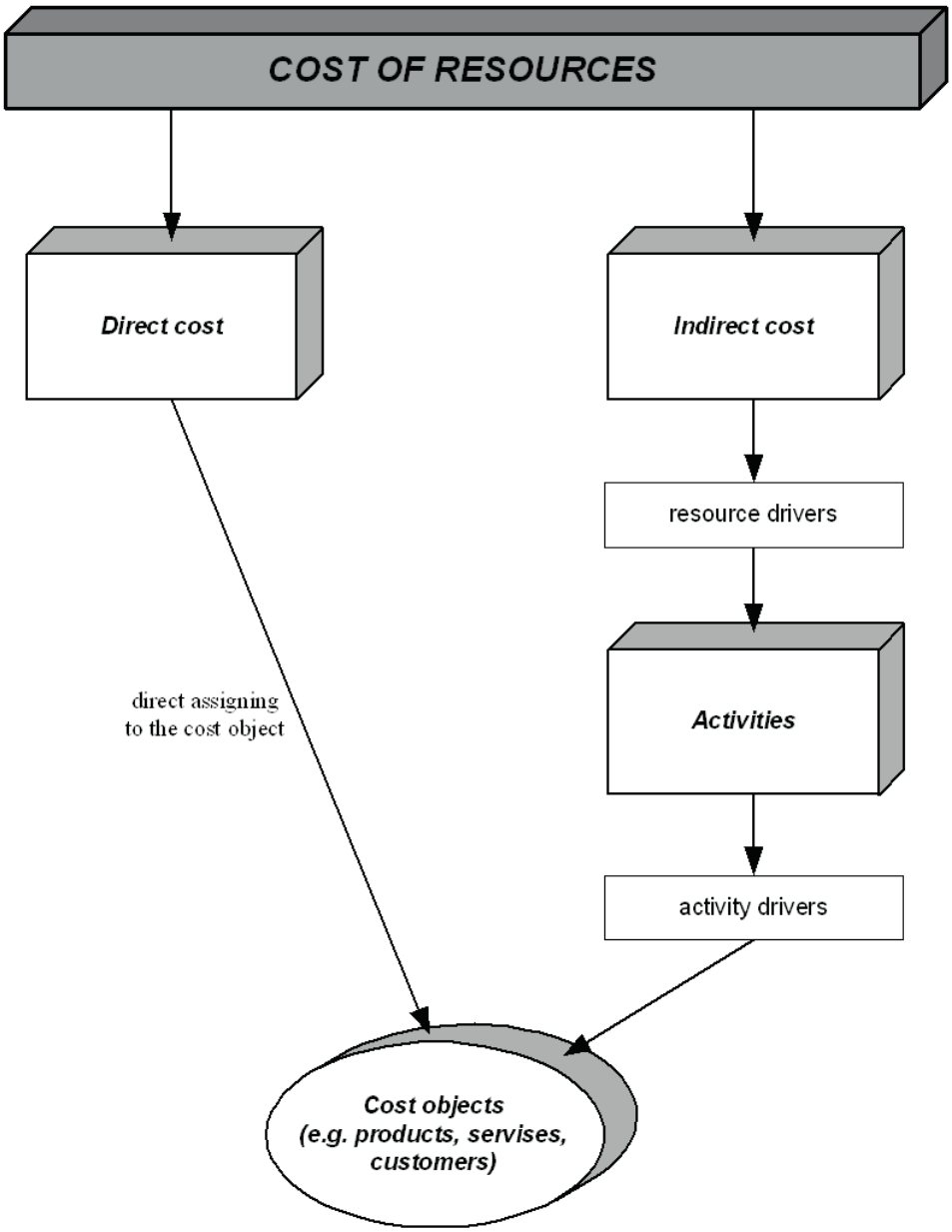

Fig. 2. Cost calculation basis of the ABC method.

The fundamental premise underlying the ABC method is to provide the ability of management of all company departments. That is why every action should be deliberate. The acquaintance of actions carried out enables managing them within the enterprise and making the right decisions concerning occurring processes and resources used within their framework [5].

The internal and external factors determining the development of Activity Based Costing are shown in the Fig. 3.

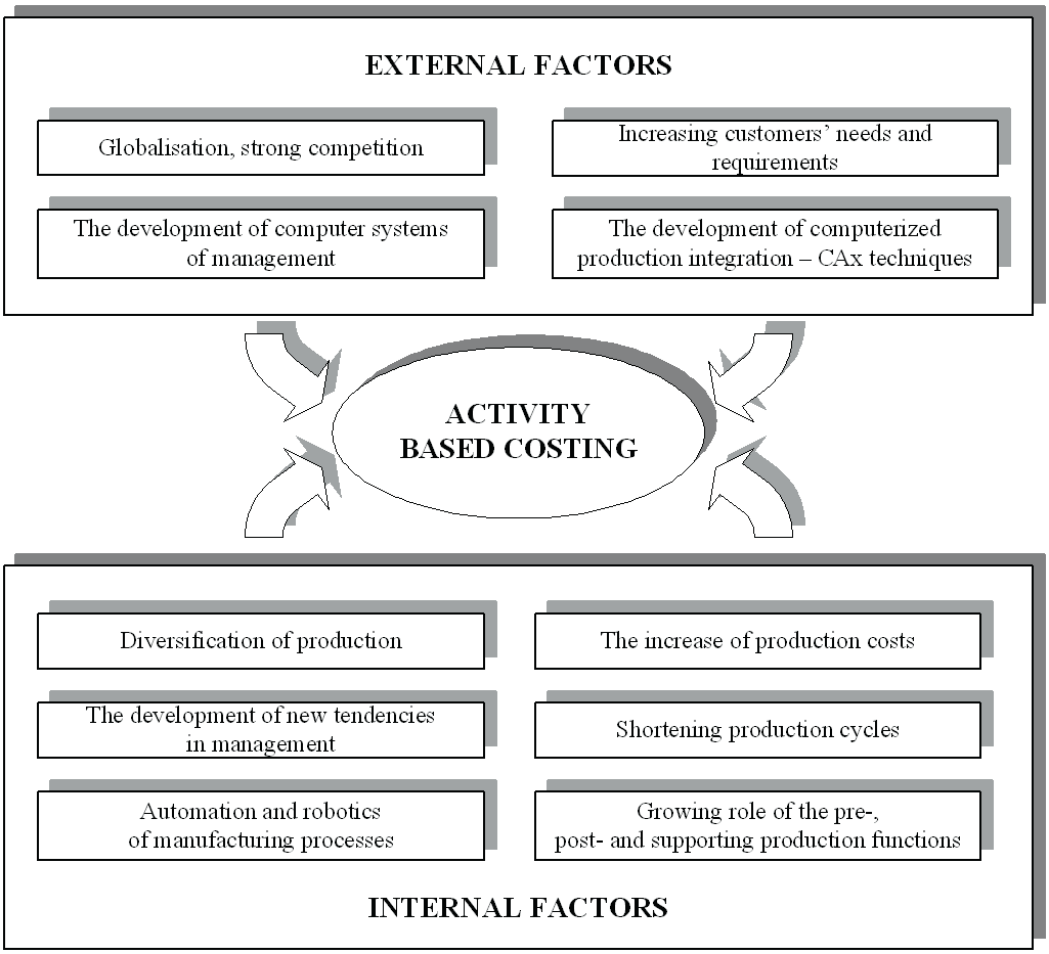

Fig. 3. Factors determining the development of Activity Based Costing (own elaboration based on [1, 9, 11]).

3. Determining process and activity cost

Activity Based Costing requires a fresh look at the issue of company costs within the company. While traditional cost accounting systems allow for assignment of incurred costs for the purposes of financial reports and cost control in the areas where the costs have been made, the ABC system allows for gaining answers to the following questions [5, 12, 13]:

- What purposes do the company resources serve?
- What is the cost generated by particular processes and activities realised in the company?
- Why does the company have to realise particular economic processes and activities?
- What factors affect the altitude of the costs of particular processes and activities?
- What part of these activities fall on the following cost objects: product groups, groups of services and company product purchasers?
- Which activities carried out within the framework of the processes constitute value, and which lead to its reduction?

In the Activity Based Costing method it is assumed that not the products are directly related to emerging costs, but the activities and processes, which need to be realised in order to create these products. By activity we should understand the set of repeatable, homogenous or similar events and actions carried out in order to realise a defined economic function and making costs emerge in relation to the consumed resources [5]. Therefore elaborating Activity Based Costing is carried out in the following stages:

- Identification of processes within the company
- Identification of existing activities
- Assigning resources to activities and measuring the costs of these activities
- Indicating the factor or factors affecting the height of costs of the defined activity (defining distribution keys)
- Forming in each center, in which the costs are generated, the center which is responsible for them all

We can divide activities into direct and indirect ones. The direct activities are those which directly take part in the process. The indirect activities, on the other hand, do not support cost object directly, but they ensure assistance for other indirect activities and also for activities influencing directly the cost objects.

Generic costs settled for cost positions are further calculated into activities realised on particular positions based on assumed assignment measurements. Activity cost assignment starts with indirect activities of the lowest levels leading up to direct activities. These costs are assigned into the remaining activities according to the quantity of services provided. In the process of settling accounts the benefits for direct activities and indirect activities of higher degree are taken into consideration as well as supplying mutual services among indirect activities within the same degree (Fig. 4).

In order to establish the rate of activities, namely real, individual provisions costs of particular activities, taking into account assignment mutual benefits within the range of the same degree, one may use one of the methods commonly applied in cost assignment of auxiliary production, presented, among others, in [14].

Knowing the cost rates of particular activities one can commence assigning their costs:

$$k_{d_i}^{d_j} = x_{d_j} \times u_i^j \tag{1}$$

where:

$k_{d_i}^{d_j}$ – the provision cost of activity “j” for activity “i”,

x_{d_j} – the rate of activity “j” (taking into account possible mutual assignment),

u_i^j – the number of units measuring activity “j” falling on activity “i”

This course of action gives us the opportunity to determine accurately the costs of activities included in the set of processes analysed, and owing to that, also total costs of these processes. In the circumstances of diverse activity, diversified production, the piece of information concerning complete process costs, even precisely determined, is insufficient. It is also important to “load” particular activity and process costs with cost objects, due to which it is possible to determine what demand for realized activities are generated by individual cost objects.

The full procedure of activity cost assignment on the example of processes ensuring quality is presented in papers [15] and [16].

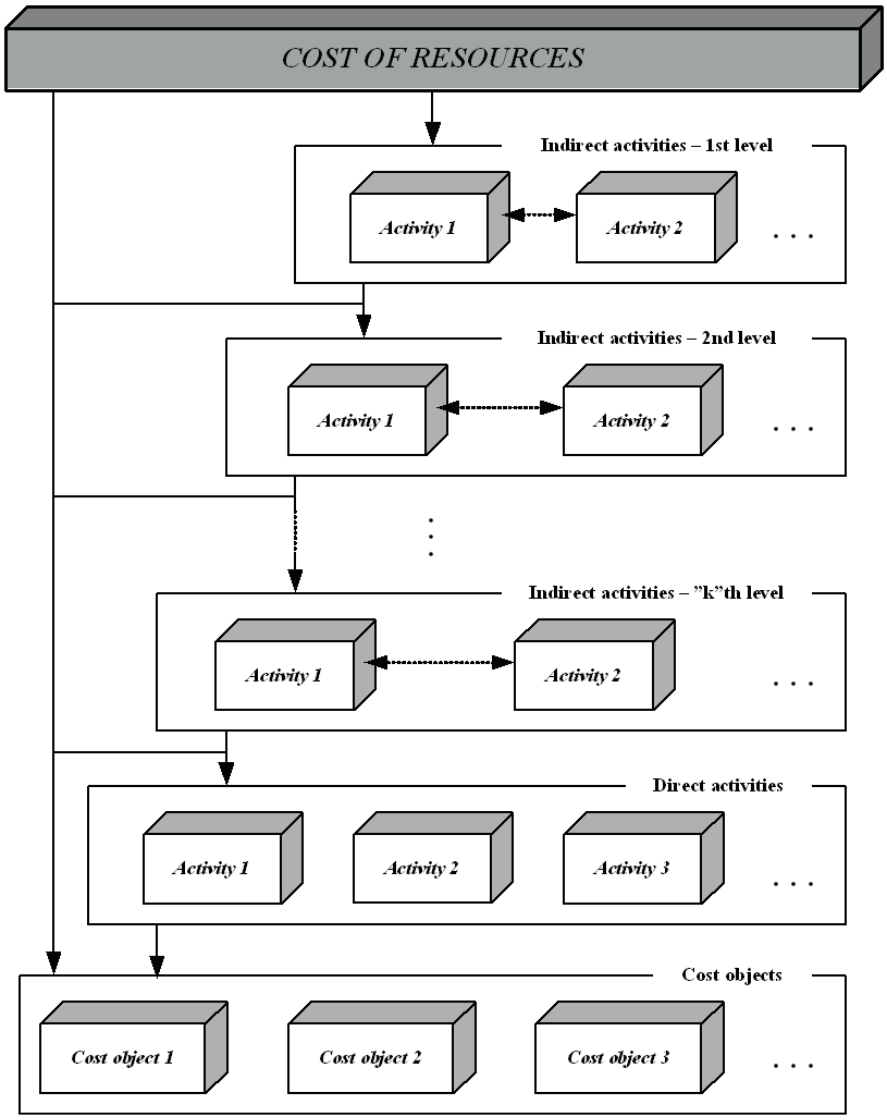

Fig. 4. Activity cost assignment.

4. Process improvement in companies

ISO 9000:2000 and 9000:2008 edition puts special emphasis on the process approach in organizations. According to ISO 9001 standard, in order to implement and maintain a quality management system, the organization should [17]:

1. Identify the processes needed for the quality management system
2. Determine the sequence and interaction of these processes
3. Determine criteria and methods needed to ensure that both the operation and control of these processes are effective
4. Ensure the availability of resources and information necessary to support the operation and monitoring of these processes

5. Monitor, measure and analyze these processes
6. Implement actions necessary to achieve planned results and continual improvement of these processes

Determining the cost of process basis of the Activity Based Costing method makes possible taking rational decisions connected with the process improvement. Analyzed processes in enterprise deliver data to conduct cost calculation basis of ABC method. As a results we get information concerning the effectiveness of taken activities, borne costs and processes that require streamlining. The information aids the decision processes connected with improving processes in enterprise (Fig. 5). Process improvement aided with the ABC method is shown in the Fig. 5 on the example of quality assurance processes. As it is shown in [18], the use of the ABC method in the cost of quality measurement enables detecting improvement opportunities in the production process thanks to determining both value-added and non-value-added quality-related activities. Cost analysis and advantages connected with processes realization and researches of solutions making a success for enterprises require taking Rummler and Brache's three levels of efficiency into consideration: organization, process and work station [19].

It is recommended to improve processes in companies with the Activity Based Management system that focuses on processes management and actions in order to rising the value obtained by customer and increasing profits spring into existence thanks to creation of that value. That system should include analysis of factors that generate cost, activities analysis and efficiency measurement.

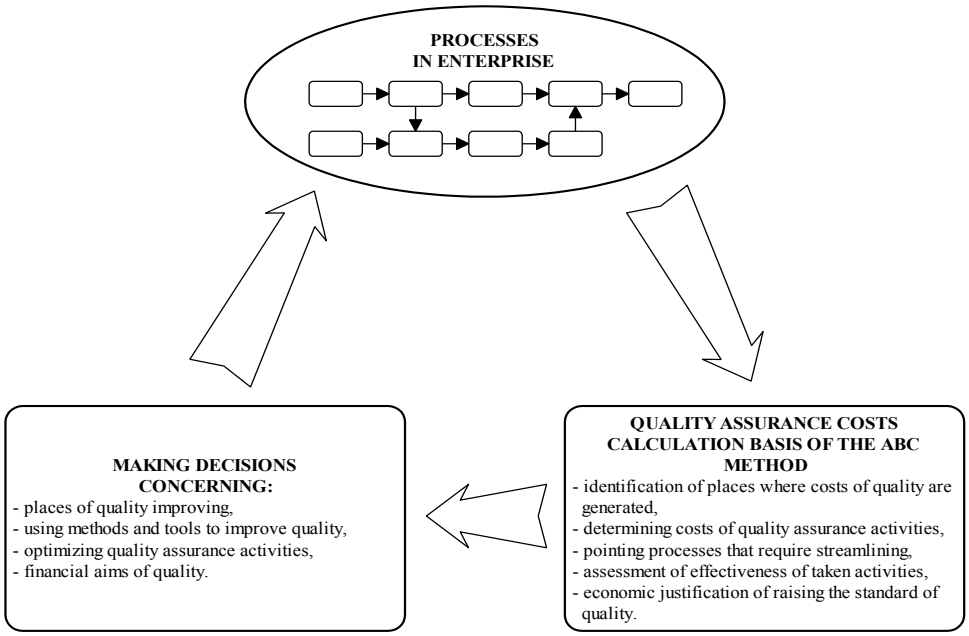

Fig. 5. Quality assurance processes improvement basis of the ABC method.

5. Conclusion

According to studies conducted by the authors and other researchers [1, 4, 6, 8, 11, 12, 15, 18, 20, 21], the traditional cost account does not provide the possibility of accurate designating particular components related to processes taking part in the company. The proposed method of cost calculation based on Activity Based Costing makes it possible to determine precisely the process costs and included in them activities loaded particular cost objects, it identifies the structure of these costs, and also the places of their origin. It also indicates the areas (of activity), which in a considerable way influence the amount of these costs. The detailed analysis of costs in particular stages of the production process enables minimising the total production cost while meeting the requirements of product recipients at the same time.

According to the approach assumed in this work, one may extract different components of company costs. These could be: quality costs, the cost of implementing a computer system in the company, the cost of logistics in broad or narrow approach, the cost of materials management, the cost of gaining new clients and customer service, etc.

It is important to note that implementing Activity Based Costing in production practice is a very difficult task. The most important constraints related to application of the ABC method are [5]:

- Functioning of most companies on the basis of traditional, functional organisational structures
- Time-consuming implementation process (most implementation operations described in books on this subject took from three months to two years)
- Correct identification of activities within the organisation and establishing the units of their measurement
- The necessity of involving managers of basic and auxiliary production, as well as purchasing department, sales department, marketing and accounting department and so on in the implementation process
- Considerable work input and high cost of making the ABC system work
- The necessity of constant updating of the system after its implementation

The difficulty of implementing this method lies also in the fact that, there is no universal algorithm, which could be applied in every enterprise. It is not available also in the form of computer programs, which are relatively easy to implement. The method of determining cost based on the ABC account must be elaborated separately for each enterprise taking into consideration the specific conditions of its functioning.

Received results of the conducted research point at the need to continue the study on it. Complex analysis of the processes within production system in enterprise will be able thanks to the Activity Based Management system. That system will enable managing processes and activities to increase the profits. Therefore, it is necessary to build the model that will be focused on the process cost factors analysis and the process efficiency measurement.

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