

PRODUCTION COSTS MANAGEMENT BY MEANS OF INDIRECT COST ALLOCATED MODEL

Berislav Bolfek¹, Jasna Vujčić²

¹Polytechnic Slavonski Brod, Croatia, berislav.bolfek@vusb.hr

²High school "Matija Antun Reljković", Slavonski Brod, Croatia, jasna_4@net.hr

Abstract

Management costs in a business system requires planning, budgeting, monitoring and comparing of all kinds of expenses. When calculating a production through the production order system there always seems to appear the same dilemma; which key or keys should be chosen for allocating indirect costs. As a result, in addition to the well-known classical methods for allocating indirect costs, a new method is developed in the form of a Model for allocating indirect costs. By applying the above-mentioned model, the classical methods are omitted from the process of allocation indirect costs, which contributes to an easier and faster planning, monitoring, comparing, and reducing costs.

JEL classification: D24

Keywords: direct costs, indirect costs, allocation of costs

1. GENERAL INFORMATION ABOUT MANAGEMENT COSTS

Managing business results serves the purpose of achieving profits, which is basically calculated in a way that the realized revenues extract realized expenditures that make up different types of costs. Within the concept of managing business results, management costs occupy a particular place. This means, when increasing the revenues one should try to decrease the costs to obtain the greater profit. Therefore, management must find ways that can further decrease costs, in other words, how and what to save.

The management cost is to be, or become, if it is not already, perpetual care for management as well as all other employees in the business system. When increasing the efficiency of business system it requires active, continuous, management cost, which involves constant improving of the scope management and content costs. Occasional care costs and occasional programs for the subsequent reduction of costs will not provide good enough or great results. Therefore, only actively managing costs can best contribute to the business operations of the system.

"Every good management must understand the importance of cost and many of you set a goal to reduce them. Nevertheless, such treatment is not effective enough, when not achieving triggers for significant costs, since we often do not know them. We gladly reach for measures in the primary sector, while other areas of operations are operated by existing work habits and factors. At these areas there are a lot of activity, which are prescribed, and many are the result of knowledge in the company." (Koletnik, 2000, 4)

There are two ways to control costs: static cost management and active cost management. Static way to manage costs is marked by occasional non-systematic opportunity and take measures by management, and such measures are short-term effects. With static management costs, as a rule, the study and reduce certain types of expenses, and such cost management is appropriate only in emergency situations, i.e. when one should immediately adopt the necessary measures. Active cost management includes a permanent, systematic and timely seeking opportunities to reduce costs, and their consistent implementation. Considering that the active cost management is not a quick and short-term improvement, as opposed to static, active cost management has long-term effects.

All costs that arise in a business system are collected by the business function of accounting, within, which are the accounting costs. The task of accounting of costs is constantly recording and studying the costs by type, locations and media, as well as monitoring and study of internal business performance by product and services as well as by organizational units. Measurement and monitoring costs represent the basic prerequisite, which are fulfilled in order to gain access to the process of managing costs in the production process. Thomas speaks in favour of the fact that the total costs in manufacturing business systems, around 80% or even over 90% of the costs are waste in production, while the remaining part of the costs are waste outside the sphere of production. "In practical terms, cost management means submission to the system controlling costs. In other words, cost management includes forecasting, planning, budgeting, and control of costs and analysis show that the conduct of the costs depending on the change of circumstances and causes of deviations from the anticipated costs with a view to their retention in the acceptable limits, and insurance information managers to choose between alternatives that allow changes of direction activities in order to achieve optimal economic results." (Belak, 1995, 131)

Concept of managing costs of production in a business system means that all expenses should be planned and put within a budget, tracked and compared. Therefore, this paper will describe in more detail the planned manner of making calculations, calculation of work orders as well as a model for allocated indirect costs.

2. PLANNED CALCULATION

Management costs, among other things, mean continuous monitoring and comparison of the planned and realized. Planning activities will be done through planning calculations, which are constructed for all products and services. Planning calculation includes all resources required for the production of a product or service.

Normal process of making planning calculations used in most business systems, consisting of norms of use of individual resources that can express the quantity in the units of measure and value of currencies. In other words, the planned calculation consists of all kinds of charges, and that are according to the agents (the possibility of monitoring costs to the level of each product) divided into two groups: direct and indirect costs.

Direct costs include the following types of expenses: basic materials, auxiliary materials, cooperation and work on construction. Indirect costs can be divided into two different groups: the indirect costs of production and the costs of administration and sales. The first group of indirect costs in the production includes the following types of costs: other materials, other services, a work directed by electrical energy, thermal energy, water, maintenance, and depreciation. Another group of indirect costs are the costs of administration and sales, which include all types of costs that are related to business administration, controlling, financial accounting services, commercial services, legal and personnel services, and other administrative services (which are not directly related to production).

Because of frequent problems about the selection the way that we choose the related indirect costs by a particular product, this production planning calculation is not good enough. Why planned calculation should be made in such a way that all of the listed resources include the materials and labour. In terms of expense, materials are divided into a group of direct costs, while the work allocated to the group of indirect costs. Therefore, the labour costs that are expressed through the gross price of an hour, are all related indirect costs. Therefore, planning calculation is a first step towards an active way of managing costs of production, because it enables the determination of height deviations of costs by individual work orders (projects, objects).

3 PRODUCTION ORDER

Terminology commonly used within the propulsion bookkeeping when calculation of production is production order. However, as synonyms work orders can still use the terms: a project and object/facility. One project or facility can be realized as more work orders, and more projects or facilities may

realize as a working order, all due to cost reduction. For the clear view that to avoid any ambiguities in the text will only be used the term working order.

Monitoring costs of production to the level of each individual product, it is possible to achieve by using the system of production orders. Production order is to be used by the registered resources that are spent for the production of specific quantities of specific products. In this way, we collect all the direct costs (basic materials, auxiliary materials, cooperation and work on the construction) that arise in the preparation of certain products. When clearance of production orders or other indirect costs or expenses (other goods and services, a work directed by electrical energy, thermal energy, water, amortization and cost of administration and sales) are to be allocated it is used by selected keys on all work orders. The sum of incurred direct and indirect costs are becoming more cost for a particular work order, or product. Nonetheless to say, just the cost price for each manufactured product, which is obtained based on calculation of working order, allows the management of business systems to manage production costs and it is done in terms of monitoring by obtaining individual production orders. Thus, the basic purpose of introducing the working orders in a single business system is to manage costs of production in order to obtain the higher profit.

Introduction of production orders in production planning allows the comparison for a calculation with subsequent calculation, which is obtained based on the calculation of production orders. In this way, one determines the differences in costs and standards of planning and subsequent calculations to the next phase through specific measures and activities, which may have an impact on reducing costs. The meaning of the calculation of production orders in the manufacturing business systems is the calculation of cost price for each product that is produced in a specified time. Therefore it is necessary to perform monthly calculations of all the production orders that are in production, regardless of whether the production of those production orders are completed or are being continued in the coming months.

Direct or even referred to as direct costs, comprise all the costs that arise in the immediate production, and that can be directly associated with a specific product. The collection of direct costs per production orders does not constitute a greater problem. Indirect or indirect costs are those costs that arise in the immediate production but also outside the immediate production, and cannot be directly associated with a specific product. Therefore, the collection of indirect costs for each production order is a complex process. Considering that the given indirect costs cannot be collected by individual production orders as a direct cost, they are added to production orders according to specified timetable criteria. In the bookkeeping terminology criteria schedule of indirect costs, has also been called "keys to the indirect costs timetable." (More about it: Habek et al., 2002, 325)

The selection of a common indicator that in a situation best reflects the causes of the formation of indirect costs with respect to all types of products, determines the key schedule of indirect costs per production orders. The keys to the schedule of indirect costs represent the classical methods for allocating indirect costs per production orders. Uncertainty that regularly appears in the current calculation of production order is, the selection of keys or the keys to the schedule of indirect costs per production orders. The selection of the keys to the schedule of indirect costs is a subjective process for which there are no precisely defined and written policies. One of the ways to solve the above-mentioned uncertainty consists in the following, that there are no traditional methods for allocating indirect costs in production orders, and it should be developed a new method for allocating indirect costs. It is therefore in the next chapter described a new method for allocating indirect costs in production orders under the title: Indirect cost allocated model.

4. INDIRECT COST ALLOCATED MODEL

The starting point for developing a model to allocate indirect costs is the budget of a company, in which are involved all direct and indirect costs. "The budget is a financial plan for the organization to determine revenues, expenses, etc. for a specified period. It usually involves admission, income from sales, costs, efficiency, cash flow, etc., and the control of the budget is used to be able to monitor your own performances and be responsible for the budget. "(Avelini-Holjevac, 1998, 95)

Consequently, budgeting is the process of planning and controlling of future operations to achieve planned business objectives and policies that are being established. In other words, before describing the model in mathematical form, and for more clear comprehension of the model, it is necessary to initially define certain terms used in the model, and they are:

- Costs are specific resources that should be sacrificed or to be waived in order to achieve a certain goal, by measures in monetary units which are also stated.
- The budget is planned sum of all types of direct and indirect costs to the annual level.
- The project as the name implies, also considers, beside the projects, other facilities and production orders depending on the type of activity that deals with the business.
- The capacity in the technological sense, represents the work position, a group of jobs, drive, while in terms of expense includes the following types of costs: costs of working hours, the associated indirect costs and other related indirect costs, which are obtained by allocation.

- Direct or direct costs are the costs under which consider only those expenditures that occur in the immediate production, or to those costs that can be directly associated with a specific project, facility or work order. However, for the purposes of this model of operation work costs are not classified in the groups of direct costs, but they are found in capacities costs.
- Indirect or indirect costs are those costs that can not be monitored by the level of individual projects, facilities or work orders, so you should need to allocate for each project, facilities or work orders. Thus, the indirect costs in this model are divided into: the associated indirect costs and other indirect costs.
- The associated indirect costs are costs that are immediately (directly) added to individual types of facilities. These may be the following costs: the cost of depreciation, maintenance costs, costs of medical examinations of workers, the cost of insurance for workers, etc.
- The other indirect costs include all those indirect costs that can not be sorted in by the previous group of associated indirect costs, therefore they should be allocated by individual types of capacities.

Indirect costs allocated model is shown in the following terms:

$$TP_{ij} = IT_{ij} + \sum_{m=1}^n TK_{mj}P_i \quad (1)$$

Where:

i - the number of projects ($i = 1, 2, \dots n$)

j - month of the year ($j = 1, 2, \dots 12$)

TP_{ij} - cost of i -th project for the j -th month

IT_{ij} - direct costs of the i -th project for the j -th month

$TK_{mj}P_i$ - the cost of m -capacity in j -th month for the i -th project

Costs of the m -capacity in j -th month for the i -th project are equal to the sum number of product hours of m -capacity of which are spent on i -th project and the value of hours of that capacity:

$$TK_{mj}P_i = SK_mP_i \cdot VS_m \quad (2)$$

Where:

$TK_{mj}P_i$ - the cost of m -capacity of the j -th month for i -th project

SK_mP_i - the number of m -capacity hours of which are spent on i -th project

VS_m - Value of the m -capacity hour

The value of m - capacity hour is calculated:

$$VS_m = \frac{TK_m}{SK_m} \quad (3)$$

Where:

VS_m - Value of the m-capacity hour

TK_m - the cost of the m-capacity

SK_m - number of the m-capacity hours

Based on this expression, using the hour values (prices) of each type of capacity it is possible to make comparisons with prices of hours of competitions on the market.

Considering that in the budget base preparation parameter for planning indirect costs to the value of an hour, a business management system receives a continuous way to control the planned and realized.

The costs of the m-capacity of the sum equals to the total value of hours for the m-capacity, and the value of the coefficient for other allocated indirect costs to the m-the capacity and associated indirect costs of the m-capacity:

$$TK_m = UVS_m + Vk_m + PNT_m \quad (4)$$

Where:

TK_m - expenses for the m-capacity

UVS_m - the total value of hours for the m-capacity of these

Vk_m - the value of the coefficient for other allocate indirect costs to the m-capacity of these

PNT_m - associated indirect costs of m-capacity of the

The coefficient value of these other allocated indirect costs in the m-the capacity is calculated:

$$Vk_m = ONT \cdot k_m \quad (5)$$

Where:

Vk_m - the coefficient value of the allocated indirect costs in the m-capacity

ONT - other indirect costs to allocate by capacities

k_m - coefficient for allocating of these other indirect costs in the m-capacity

The coefficient to allocate these other indirect costs in the m-the capacity is calculated as following:

$$k_m = \frac{\sqrt{SK_m \cdot UVS_m}}{\sum_{m=1}^n \sqrt{SK_m \cdot UVS_m}} \quad (6)$$

Where:

k_m - coefficient for allocating these other indirect costs in the m-capacity

SK_m - number of the m-capacity hours

UVS_m - the total value for these m-capacity hours

5. CONCLUSION

The indirect costs allocated model is set in a manner that the indirect costs are apportioned by capacity in two interrelated steps, the first step, the cost are immediately (directly) associated to certain types of capacity, and are called the associated indirect costs. The second step is scheduling the indirect costs that include allocation of these costs by using the coefficient on individual types of capacity, and resulting costs are named the other indirect costs.

The associated indirect costs are those costs that may result in connection with a particular type of capacity (a position, a group of jobs, drive) and most often are the costs of depreciation, maintenance, medical examinations of workers, security workers, etc. Other indirect costs include those indirect costs that can not be sorted in the previous group of associated indirect costs such as: costs of administration and sales, staff costs for operating expenses, insurance and protection of property, etc.

Table 1 shows the allocation of indirect costs by individual types of capacity in order to show the way in which to allocate indirect costs by using a model for allocations of indirect costs, all on the basis of test data.

Table 1 Allocation of indirect costs by capacity

1	Capacity type (K)	Locksmiths	Welders	Machining	Consultants
2	Number of capacity (m)	1	2	3	4
3	The total number of hours (SK)	9000	7000	5000	2000
4	Total hours value (UVS)	180.000,00	175.000,00	150.000,00	100.000,00
5	Coefficient for total hours value schedule (k)	0,345	0,300	0,234	0,121
6	Coefficients value (Vk)	276.000,00	240.000,00	187.200,00	96.800,00
7	Added indirect costs (PNT)	5.000,00	70.000,00	120.000,00	60.000,00
8	Capacity costs (TK = UVS + Vk + PNT)	506.000,00	485.000,00	457.200,00	256.800,00
9	Hours value (VS = TK : SK)	56,22	69,28	91,44	128,40

Source: calculated by author

Note: In the italics are indicated the values obtained by monitoring, and in bold are indicated

values obtained by using the model for allocating indirect costs.

In this example, the other indirect costs (ONT) that should be allocated by capacities by using the coefficient (k) in amounts of HRK 800,000.00. The calculation is made according to formulas 3 to 6, and the amount of allocated other indirect costs by the types of capacity can be seen from the number 6 which is located in the Table 1.

By the application of Models to allocate indirect costs it should be stated that the classical methods of process of indirect costs are omitted, and therefore, no longer should be used by subjective process when choosing keys for the allocations of indirect costs per production orders. Therefore, the model to allocate indirect costs represents a new dimension within the concept of managing the costs of production, which will definitely contribute to easier, and faster planning, monitoring, comparing, and reducing costs.

REFERENCES

1. Avelini-Holjevac, I. (1998). Controlling: Managing business result, Hospitality Management, ISBN 953-6198-15-0, Opatija
2. Belak, V. (1995). Managerial accounting, RRIF plus, ISBN 953-6121-04-2, Zagreb
3. Habek, et.al. (2002). Stock and stock management, RRIF plus, ISBN 953-6121-60-3, Zagreb
4. Koletnik, F. (2000) Active cost management, Accounting and Finance 8, 3-14, ISSN 0350-4506, Zagreb