Chapter 16

RESOURCE BASED COSTING MODEL

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INTRODUCTION

Companies carry out their production activities by converting their monetary resources into resources of production factor. In fact, production factors, just like monetary resources, should be considered as operating resources that need to be extremely sensitive in their consumption. As can be seen from the literature, this view is becoming widespread not only in relation to production activities, but also resources allocated to all business activities. When production factors are approached with the concept of resource, planning of supply and consumption amounts of production factors comes to the fore. The concept of resource also evokes an investigation of the optimum in relation to the allocation of production factors (the amount of holding in the enterprise) and their consumption. In the resource approach, a relationship is established between the consumption amounts and the consumption objectives of resources both in the budgeting and control stages. It is tried to reach the optimum resource distribution and consumption in the enterprise by searching for answers such as which resource should be consumed for which purpose (cost object), how much of a resource should be kept in the enterprise in a period, and if there is a difference between the amount consumed and the amount that should be consumed.

The purpose of resource-based costing (RBC) method is to reach the information on the right product, activity and resource cost based on standard resource consumption of cost objects. ***Our resource-based approach is based on our thesis that if the consumption of a resource is correctly determined for which cost object and its cost is charged to the cost object that consumes it with objective measures, the correct cost is charged to the correct cost object.*** The most original aspect of the method is to group resources according to their relations with cost objects and to determine the standard cost of the products based on standard resource consumption within the framework of this grouping. In our study, resources will first

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be grouped according to their relations with cost objects, and then based on this grouping, it will be revealed how the cost of standard product will be determined according to a template.

1. GROUPING OF RESOURCES

All kinds of physical assets and services transferred to the company by consuming monetary resources such as materials, labor, machinery, equipment, buildings, outsourced benefits and services are the resources allocated to business activities. These resources are consumed for first cost object- products, or second cost object- product-related activities carried out at the main activity centers, or the third cost object- auxiliary activities performed at the auxiliary activity centers. Sometimes, the fourth cost object- cost of secondary resources such as product design, production line design or improvement that will be consumed during the life stages of the products, technological (or economic) lifetimes of the production lines with their activation, by consuming some of these resources. In RBC, according to their cost objects, the above-mentioned resources are grouped as:

a) First cost object – the resources consumed for the products, ***DIRECT RESOURCES***
b) Second, third cost objects – the resources consumed for the activities and the fourth cost object, the resources consumed for the secondary resources, ***INDIRECT RESOURCES***.

In RBC,

a) The resources allocated for the budget period and consumed during the budget period are defined as ***PRIMARY RESOURCES***,
b) The resources consumed for activities that will be benefited for a long period, although they are carried out in a short period, that are charged on the relevant cost object in a long period by activating the costs, and formed by the consumption of more than one primary resource are defined as ***SECONDARY RESOURCES***.

In RBC, the cost of direct resources are covered within the direct cost of the product. The costs of indirect resources constitute the activity costs of the activity centers. The products are charged activity cost as much as the activity they consume at the activity centers. The activity costs that the products are charged from the main activity centers constitute the indirect costs of the products. Since the activities are carried out by the activity centers, the resources consumed for the activities are planned and managed according to the activity centers, the activity costs are determined and budgeted according to the activity centers.

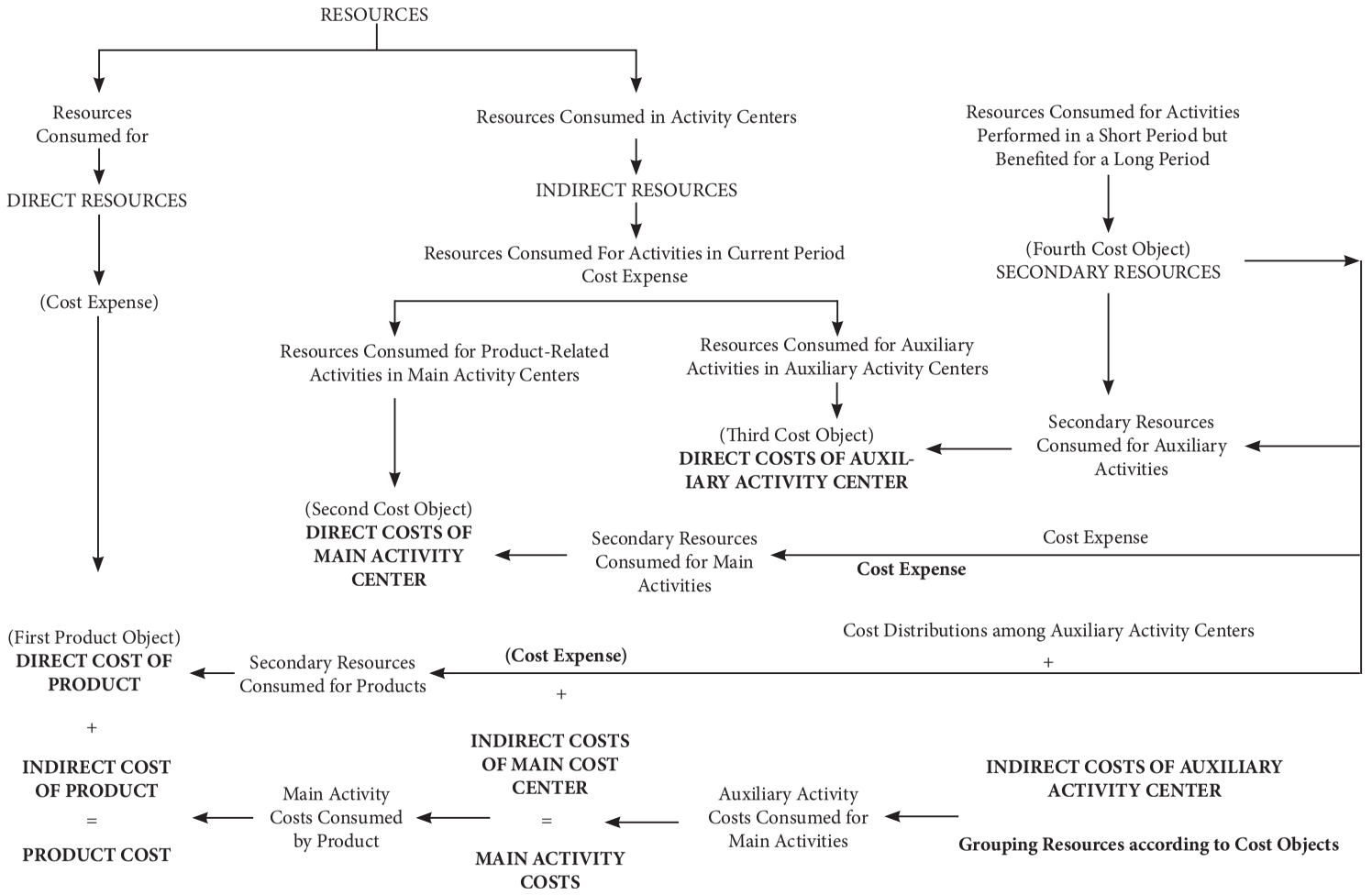
The costs of the indirect resources consumed by the main activity centers constitute the cost of the main (product-related) activity performed by the activity center. In the first stage, in multi-product and segmented enterprises, a single main activity can be grounded on in each main activity center in order to provide practicality, as it is difficult and costly and requires a long time and qualified personnel to make process analyzes, identifying the activities that forms the process and to determine the resource consumption of these activities and each product in these activities. After the system is established, it is possible to apply RBC method in more detail by making process analyzes. On the basis of a single auxiliary and a single main activity in the activity centers, the standard costs of the indirect resources allocated to the auxiliary and main activity centers (activity cost centers) are determined in the flexible activity cost budgets of each activity center, and the rate of charging standard activity costs of the auxiliary and main activity cost centers are stated in these budgets.

Standard auxiliary activity costs are charged to the main activity cost centers as far as they consume from these activities through the AAC (auxiliary activity center) standard activity cost charging rates, and the standard main activity costs are charged to the products as far as they consume main activity through the MAC (Main activity center) standard activity cost charging rates. In the process analysis, when more than one main activity is determined in the main activity centers, standard resource amounts and costs are budgeted for each activity in the flexible activity cost budgets of each main activity center and the charging rate is determined for each activity. The standard cost of each product (standard indirect cost) in each activity is determined based on the standard activity cost charging rate of each activity and the standard activity consumption amount of each product in each activity. In order to achieve ***flexible budgeting*** in both ways, it is necessary to differentiate between the variable activity costs budgeted per activity measure and the fixed activity costs budgeted based on the activity volume in a certain period when budgeting standard resource costs. ***In this method called resource-based costing,*** where activity costs are determined and budgeted on the basis of variable and fixed resource costs, ***it is possible to plan (allocate) the resources optimally according to the activities and determine the variable and fixed costs of the products by using accurate and objective measures.***

The direct cost (direct resource cost) of the product in RBC does not mean the direct cost of the product in the traditional system. In RBC, more cost expense (resource cost) is included in the direct cost of the product. In RBC, the indirect cost (activity cost) of the product and the indirect cost of the product determined in the traditional system (general production cost- GPC) do not mean the same.

In the activity cost, which consists of the costs of all indirect resources consumed by the activity centers, less cost expense (resource cost) is included compared to the GPCs of the cost centers that correspond to the activity centers in the traditional system. While the costs of resources such as energy, auxiliary material used in production, machine mold used for only one product, field depreciations and related expenses, fees of product specialist are covered within the direct resource costs of the product in RBC, in the traditional system, these cost expenses are covered in GPC and included in the indirect cost (GPC) of the product by being distributed to all products. As a result, while the direct cost of the product does not correspond to the cost of the resources consumed by the product, the distribution of the costs of the resources consumed for only one product to all products within their GPC prevents us from reaching the right product cost information. In addition to all these, although the concept of cost expense can be addressed with the meaning of the internal monetary value (cost) of the consumed part of a resource, it does not make any connotations about issues such as ensuring optimal distribution of resources, planning (budgeting) and controlling optimal resource consumption. Since resource consumption in RBC can be monitored in terms of cost objects, they have the feature of being an reliable guide in reaching correct product cost information. For example, in RBC, it is possible to determine that resources such as depreciation and rents of machinery, apparatus, mold used in one product and the fees of product specialist are the resources consumed for the product and for which product they are consumed, since resource consumption of cost objects is based on. ***In RBC, grounding on resource consumption according to the cost objects and budgeting of resource consumption according to the cost objects enables an accurate costing based on objective measures.*** In RBC, cost information is aimed to allow flexible budget and management accounting applications by taking into account the consumption forms of resources in cost objects. Accordingly, the costs of resources are grouped as ***VARIABLE RESOURCE COST***, which is the cost of resources consumed per product unit/activity measure, and ***FIXED RESOURCE COST***, which is the cost of resources allocated for the products to be produced/activities to be performed in the budget period based on the budgeted production amount and activity volumes. The most important feature of RBC is to make ***resource allocations*** based on the targeted production amounts for the products, and the targeted activity levels for the activities, and the standard consumption of the resources per product unit or activity measure unit. Thus, it is possible to benefit from scarce resources in the most efficient way by preventing resource waste, excessive or deficient resource allocations. In RBC, the stocking characteristics of the resources are taken into account in the optimal allocation of

resources. It is aimed to stock the stockable resources (materials, machinery, etc.) at the optimum level in the enterprise, and the non-stockable resources (labor) to be kept at the optimum level in the enterprise. For this, the standard amounts of the consumption of both resources per product and activity measure are determined and the optimum stock and optimum holding levels of the resources are determined in terms of the targeted (budgeted) production amount and activity volume levels. In RBC, the costs of the parts that cannot be consumed (used) of the non-stocked resources are allocated as unavailable resource costs. The costs of resources that cannot be consumed in the production of products and in the realization of the activities are not charged on the cost objects, instead, they are considered as period losses and the product cost is prevented from being affected by the variance in the activity volume. In addition, it is ensured to investigate whether the resulting resource waste is caused by excessive resource and activity budgeting or if production at the required level is not achieved. In the figure below, the grouping of direct and indirect resources according to their consumption characteristics in terms of cost objects is shown schematically.


RESOURCES
Resources Consumed for
DIRECT RESOURCES
(Cost Expense)
Resources Consumed in Activity Centers
INDIRECT RESOURCES
Resources Consumed For Activities in Current Period
Cost Expense
Resources Consumed for Product-Related Activities in Main Activity Centers
Resources Consumed for Auxiliary Activities in Auxiliary Activity Centers
Resources Consumed for Activities Performed in a Short Period but Benefited for a Long Period
(Fourth Cost Object)
SECONDARY RESOURCES
(Third Cost Object)
DIRECT COSTS OF AUXILIARY ACTIVITY CENTER
Secondary Resources Consumed for Auxiliary Activities
(Second Cost Object)
DIRECT COSTS OF MAIN ACTIVITY CENTER
Secondary Resources Consumed for Main Activities
Cost Expense
Cost Expense
(First Product Object)
DIRECT COST OF PRODUCT
+
INDIRECT COST OF PRODUCT
=
PRODUCT COST
Secondary Resources Consumed for Products
(Cost Expense)
+
Cost Distributions among Auxiliary Activity Centers
+
INDIRECT COSTS OF MAIN COST CENTER
=
MAIN ACTIVITY COSTS
Main Activity Costs Consumed by Product
Auxiliary Activity Costs Consumed for Main Activities
INDIRECT COSTS OF AUXILIARY ACTIVITY CENTER
Grouping Resources according to Cost Objects

2. STEPS OF RESOURCE-BASED COSTING MODEL

In the resource-based costing system, the following steps must be performed in order to determine the standard commercial unit cost of the product.

1. Determining the activity centers that carry out product-related activities,
2. Identifying the cost drivers that reflect the consumption of products in the activity centers' activities and enable us to measure them,
3. Determining the standard activity consumption of each product based on the activity driver or drivers in each activity center,
4. Determining of targeted production amount for the budget period,
5. Determining of consumption amount, price and cost standards per product unit of direct variable primary sources,
6. Budgeting of the production amount of product during its life cycle and budgeting of the cost of direct variable secondary resource in relation to the direct secondary resources that are supposed to be consumed per unit of product,
7. Budgeting direct fixed primary and secondary resources and making allocations in (primary) resources based on the targeted production amount for each product as of the budget period.
8. Budgeting of the targeted (normal) levels of one or each activity (budgeting of the normal capacities of the main activity centers) based on the budgeted product amount of the main activity centers carrying out product-related activities and the cost drivers standards set for their activities in a single or each activity,
9. Budgeting of the normal capacities of the auxiliary activity centers based on the normal capacities of the main activity centers,
10. In the flexible activity cost (indirect source) budgets of each auxiliary and main activity center,
    a) Determining the consumption amount, price and cost standards of variable indirect primary sources per each activity/auxiliary production/auxiliary service measure,
    b) Regarding the secondary resources that are supposed to be consumed per each activity/auxiliary production and service measure, budgeting the amount of the main activity/auxiliary production and service measures to be taken as basis in the consumption of the resource during the technological or economic life of the secondary resource and determining the secondary resource costs per activity measure,
    c) Budgeting of the fixed indirect primary and secondary resources of the main activity and auxiliary activity centers based on the targeted activity volume as of the budget period (allocation of resources in primary resources),

d) Determining the variable auxiliary activity costs budgeted per activity/ capacity measure in the flexible indirect resource budgets of the auxiliary service and production centers and the fixed activity costs allocated for the budget period. In RBC, the variable and fixed parts of the semi-variable costs are budgeted separately, since the standard resource consumption of the activities is based on the actual costs of the semi-variable costs.
e) Transferring the budgeted variable and fixed activity costs of the auxiliary production and service activity centers to the flexible activity cost budgets of main activity centers as much as they consume auxiliary production and services (usually in the case of a single major activity carried out in the production activity centers),
f) Including variable and total fixed activity costs per activity measure in the flexible activity cost budget of each main activity center,
g) Including the indirect variable and fixed unit standard costs of product in standard product cost tables, by multiplying standard main activity consumption amount of the product and variable and fixed activity cost charging rates budgeted per main activity measures. Identifying the variable, fixed and total unit cost of the product by adding the variable and fixed indirect costs and directs costs of the product. Also, determining the total fixed primary, secondary resource and total fixed cost of the product as of the budget period.

3. STANDARD PRODUCT COST TEMPLATE IN RBC

In RBC, standard product costs are determined in a cost table to be prepared for each product according to a template like the table 1.

STANDARD COSTS	A ACTIVITY CENTER			B ACTIVITY CENTER			STANDARD UNIT COSTS (TL/PCS)				TOTAL FIXED COST (TL/ Month.Bud. Pro.Amt.)
DIRECT COSTS	St. Amount	St. Price	St. Uni. Cost	St. Amount	St. Price	St. Uni. Cost	FULL COMMERCIAL	Direct	Variable	Fixed	
Direct Material			125TL/Pcs				125				
Direct Labor	5 min/Pcs		30 TL/Pcs				30				
Energy	1.50 kWh	8 TL/kWh	12 TL/Pcs				12				
Auxiliary Material		10TL/Pr.min.	10 TL/Pcs				10				
Variable Secondary Resource Cost	0.90 Proses min./Pcs		9 TL/Pcs				9				
Direct Variable Cost			186 TL/Pcs				186	186	186		
	Bud. Cost	Bud. Production Amt.	St. Uni. Cost	Bud. Cost	Bud. Production Amt.	St. Uni. Cost					
Direct Fixed Primary Resource	200000 TL/ Month	10Pcs/Month	20 TL/Pcs				20				
Direct Fixed Secondary Resource	500000 TL/ Month	10Pcs/Month	5 TL/Pcs				5				
Direct Fixed Cost	250000 TL/ Month	10Pcs/Month	25 TL/Pcs				25	25		25	250000
INDIRECT COSTS	St. Opr. Cons. Amt.	St. Opr. Costs Chr. Ave.	St. Opr. Cost	St. Opr. Cons. Amt.	St. Opr. Costs Chr. Ave.	St. Opr. Cost					
Indirect Variable Cost	0.90 Pr.min./ Pcs	40 TL/Pr.min.	36 TL/Pcs	0,005 QCh/Pcs	6000 TL/QCh	30 TL/Pcs	66		66		
Indirect Fixed Cost	10 Pro. Par./ Month	15000 TL/Pro.Par.	150000 TL/ Month Uni. Pro. C.	100KKP/ Month	3000 TL/QCP	300000 TL/ Month.Bud.Pr	45			45	450000
TOTAL							322	21.1	252	70	700000

Note: For convenience, the Table is limited to two activity centers.

Pr.min.: Process minute Pro. Par.: Production Party Month.Bud.Pro.Amt.: Monthly Budgeted Production Amount QCh: Quality Control Time (Hour)

4. CONCLUSION

The fact that the consumption measures of the resources consumed for activities allowed us to measure the relationship between resources and cost objects (products, activities) with an objective measure led us to a budgeting and costing method based on standard resource consumption. In reality, cost objects consume resources, and it is often possible to determine how much a resource should be consumed for which cost object in which activity center actually or at least with engineering calculations. Also, based on resource consumption in costing, it also enables us to have a safe and reliable guide in charging costs to the right cost objects.

While developing RBC, we have sought to provide cost information that enables management accounting practices as well as accessing the right product and activity information. In RBC, it is possible to determine the fixed costs of products using objective measures in break-even point (BEP) analysis, which has an important place in profit, sales, volume planning and price decisions. In traditional methods, the problems of determining the fixed costs of the products with subjective measures do not allow for reliable BEP analysis of products. For this reason, it has been aimed to determine the product costs on the basis of variable costs and their profitability with the contribution margin approach. However, in this approach, the inclusion of direct fixed and indirect fixed costs directly related to the products within the common fixed costs, without associating them to the products, prevents us from reaching the right product cost and profit information and causes us to approach the issue with a very easy approach.

Variable product costs are also determined using very sensitive and objective measures in RBC. In particular, the inclusion of variable secondary resource costs, variable activity costs, and direct source costs with variable character such as energy and auxiliary material within the variable cost of the product, enables us to determine a much more accurate and sensitive variable product cost compared to traditional systems. RBC also enables us to access the correct activity cost information, as activity costs are determined based on the costs of the resources consumed by the activities. Accurate product and activity cost information gives us the opportunity to accurately evaluate the performance of products and activity managers.

One of the most important aspects of RBC is that it ensures the optimum distribution of scarce resources throughout the enterprise through flexible budgets and to prevent unnecessary, insufficient and excessive resource allocations. Thus, the ground for just-in-time production (JIT) is provided in the enterprise, and the

preparation of activity budgets is extremely easy thanks to the database created by RBC.

In RBC, it is possible to identify the inefficiencies and inaccuracies in resource - volume - production planning and production activities by monitoring the consumed costs under the title of unavailable resource costs, as non-stockable resources are not consumed in the cost objects and are kept in the enterprise.

RBC, which is a new standard cost determination and budgeting method, is a method for determining commercial costs as not only industrial costs, but also all product-related activities and their standard activity consumption.

Our aim in developing such a method is to develop product profitability, resource and operational efficiency measurement model, together with a product and activity costing method that accurately determines the industrial and commercial product cost information, which gains a highly strategic information feature, using objective measures in today's competitive conditions. Our next effort is to develop RBC as a cost system introduced in the Turkish scientific world and to take its place in the world literature.

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