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ACCOUNTING OF INDIRECT MANUFACTURING COST BASED ON ACTIVITY-BASED COSTING (ABC) AND ANALYSIS OF THEIR EFFECTS ON PRICING

The current article covers the application of indirect manufacturing costs according to the cost system on the basis of activities and their effect on pricing. The system considers costs based on activities from modern cost accounting systems that work to achieve a distinguished level of accuracy in determining indirect manufacturing costs through its focus, it also provides new control methods that contribute to preserving the indirect costs in the organization and rationalizing its uses, and how it affects the pricing of products. The importance of this research lays in from the fact that it is looking to clarify indirect manufacturing costs and how to allocate them and to study the costing system on the basis of activities, which aims to allocate indirect costs to products more accurately, especially with the increase in the total of indirect costs as a result of technological development and assistance to management in improving the pricing process.

Key words: *indirect manufacturing cost, management accounting, activity-based costing, measuring, pricing.*

Research problem. The global competition in our time has pressured industrial establishments to move towards modern methods of pricing in order to achieve a distinguished competitive position that enables these establishments to win markets and achieve customer satisfaction, and this matter requires reducing costs to a minimum in order for these products to compete in terms of quality and price in the markets. Therefore, the development of cost systems has become a necessity that should be dealt with objectively and scientifically to reach rational pricing decisions. The indirect manufacturing cost approach based on Activity-Based Costing and analysing their effects on pricing are the evidence of the development of accounting thought in order to overcome the shortcomings that afflicted the traditional methods of pricing, especially in the conditions of the modern industrial environment.

The research problem is the imprecise allocation of indirect costs leads to charging units unjustly produced, with its share of indirect costs, thus distorting the cost of one unit of the product. This will lead the management to unfairly pricing the products, which will result in a decrease in sales and thus a substantial reduction in profitability due

to the determination of product prices compared to the prices offered in the market.

Literature Review. The activity-based costing method is defined by many scholars. It is a method of measuring the cost and performance of activities and production process as well as the behaviour of consumers. The cost-based system of activities allow costs to be distributed among the products by the real activities consumed in production, such as; marketing, sales, delivery and product services (Dr. Hejazy-A. Suad, 2013 [1]). In addition to that, it is a method for specifying the indirect costs on products and services, this method assumes that most of the indirect costs have a relationship with the activities and vary according to the different cost directions for these activities. This method is considered the beginning of allocating these costs to activities and then to products to the extent that these products benefit from activities (Dr. Abu Hashish, 2012 [2]). The manufacturing indirect costs are divided into indirect material costs, indirect wage costs, and indirect expenses (Dr. Al-Rubaie and Dr. Al-Saqi, 2008 [3]). It also could be defined as the sum of the costs involved in the factory; however, it could not be directly allocated to any production direct charges. Moreover,

it is allocated to direct goods charges (Al-Rabee Awa, 2015 [4]).

Research goals. The research aims at the following:

- adopting the modern method of allocating indirect manufacturing costs represented by the activity-based costing method;

- providing a theoretical framework for price decisions;

- measuring the indirect cost of a product under the cost entry on the basis of activities and stating its role in the pricing decision.

Research results. The adoption of the activity-based costing method is based on a set of integrated and successive steps, which in between is a cycle for charging the indirect costs to the activity units. The following are the steps required to apply activity-based costing method:

First/Identifying and Analysing Activities. This step is considered as the cornerstone of creating and designing this system, as this stage requires reviewing the technical and organizational maps of the facility and analysing the activities and basic and subsidiary processes with the aim of identifying and classifying activities and preparing a plan for the flow of activities. It is noticed that the activities that take place within any manufacturing establishment are linked to four main levels through which the cost elements are allocated and distributed to the products; as follows:

- *Activities at the Level of the Production Unit:* They are those activities that are carried out upon the production of each unit, and thus the number of times that this activity is carried out varies according to the number of units produced, and accordingly the costs of these activities can be charged to the producing units, and examples of these activities are the installation of product parts and formulation Producer;

- *Activities at the Level of Production Batches:* they are those activities that are carried out upon the production of each group of products. Thus, the number of times in which the activities related to the batches are carried out varies according to the number of batches produced, and therefore the costs of these activities can be charged to the produced batches, but these costs are fixed in proportion for the number of units that make up each batch. Examples of which the preparation of machines are whenever production of each batch of products ends, and a batch of requested spare parts;

- *Activities at the Production Level:* they are the activities necessary for the production of each different type of the company's products and are carried out to serve the different products of the facility and thus the cost of these activities can be charged to the different products. But these costs are fixed in relation to the number of units of each product or each batch of production and from Examples: Establishing product specifications, implementing engineering change orders, and developing product-specific testing methods;

- *Activities at the Level of Facilities:* These are grouped in an optimal way as possible in a single activity center, since they are linked to production in a comprehensive manner and are not related to other parts or characteristics

of the products that are manufactured, such as lighting, guarding, cleaning.

Second / Aggregation of Activities in Clusters of Costs.

After defining the activities in the facility, the second phase begins by dividing the activities into a series of cost centers (activity cost pools). The basis of this division could be listed as follow:

1. If one of the activities has a special nature or of relative importance, it is preferable to consider it as an independent cost center. The material importance is not determined only in relation to the current circumstances, but is also determined according to the future plans of the project.

2. If there is a homogeneous group of activities and it has similar cost drivers, then it can be considered a single cost center.

3. If there are activities that are not homogeneous in terms of the nature of their work, but are consistent in the nature of their costs, that is, they have similar cost drivers and they can be grouped in one cost center (one cost collector).

4. The costs in each cost pool are directly proportional to the activity, that is, all costs in the cost pool must change in proportion to the changes in the level of activity.

Third / Identifying Cost factors. Cost factors are a means between the cost of the activity and the outputs of the products or services, and therefore it is a quantitative measurement that reflects the outputs of the activity. The factors of the costs are chosen in two stages: where the first stage is to allocate the elements of indirect costs on activities, and the second stage is to allocate the costs of activities on products. It indicates that the benefit of choosing the drivers or causes of costs in two stages enables different standards for the consumed resources that can be used in each stage as well as the availability of information on resource consumption at the center level than at the product level.

Fourth / Determining the Cost of the Products. After completing the activities grouping in the cost pools and for the purpose of charging the products with their share of the indirect costs for each cost accumulator, this is through the selection of cost. Drivers for the second stage, which must reflect the extent of the product's consumption of the resources benefiting from the activities and this is through one of the following methods:

1. Conducting the allocation of the total activity cost on the basis of the number of times the activity performed, such as the number of times the machines are equipped, the number of purchase orders, and the number of sales requests. The application of this method indicates that the occurrence of the activity consumes the same amount of resources each time it occurs.

2. Depending on the time required to complete the activity or in another way allocating the costs of the activities according to the time taken to implement the activity, such as the time it took to equip the machines.

3. The actual measurement of the resources used every time this activity is performed as a means of measuring

Table 1

Examples of activity centers, cost drivers, and the possible cost to transfer them

Activity level	Activity Center	Cost drivers	Transferable cost
Product Unit	– Activities related to machinery and product unit such as cutting, maintenance – Different Work-related activities	– Machine hours /working hours – Number of output units	– Power costs / maintenance costs / the work costs – Industrial tasks / depreciation of maintenance equipment
Production Batches	– Preparation of purchase orders / number production orders – Preparing the equipment to work /material handling	– Number of orders issued / number of times materials received – Number of production orders / number of downtime / stop hours	– Costs of maintaining records / assignments used – Business cut-off costs / Material handling labor cost
The Product	– Quality inspection / product testing – Product design/ parts inventory management	– Number of times of examination / hours of examination time – Hours of tests / number of types of parts / hours of specialist operation – Designing time hours / Number of Engineering change orders	– Cost of Quality Control / cost of test equipment – Cost of parts management / parts keeping cost / product engineering cost / designing cost / depreciation of specialized machinery and equipment
Facilities	– The factory in general – Building works – Personnel management and training	– Machine hours – Work hours – Number of workers / number of training hours	– Factory management salaries / building depreciation – Benefits and insurance / administrative cost – The cost of managing people / facilities for medical services

Resource: prepared by the researcher

costs. This method requires an extra effort to keep track of these costs and in return it leads to more accurate results, especially in those situations in which large resources are exhausted.

We calculate the indirect manufacturing cost of the units of the product, and also on the level of the total units produced. After determining (124.1 IQD/minute) in the year (2019) and (127 IQD/minute) in the year (2020) per units.

The selling price per product is determined by adding a profit margin (15% – 10%) for years (2019–2020) to the

total cost of the product according to the factory policy followed in calculating the selling price of the products.

Conclusions. Due to the importance of applying the cost-based method on the basis of activities, this requires the creation of cost awareness for workers in manufacturing units, and it is considered one of the methods through which accuracy in measurement and control can be achieved and the information necessary for planning and decision-making is provided. The awareness of manufacturing workers could enhance by holding seminars and training

Table 2

The share of the indirect manufacturing cost of one product according to ABC

Model type		Quantity	ABC per unit	Total ABC
Military clothing (2 pieces)	2019	60,000	1,491.59	89,495,192.31
	2020	62,442	1,588.57	99,193,394.88
Security clothing (2 pieces)	2019	12,350	307.02	3,791,675.13
	2020	15,700	399.42	6,270,879.41
Clothing for corporate staff (2 pieces)	2019	8,900	221.25	1,969,142.83
	2020	9,250	235.33	2,176,770.33
Services companies (2 pieces)	2019	10,800	268.49	2,899,644.23
	2020	12,000	305.29	3,663,461.54
Trousers & jacket	2019	2,670	66.38	177,222.85
	2020	3,890	98.96	384,971.29
Jacket sport	2019	5,500	136.73	752,008.21
	2020	6,050	153.92	931,193.41
Pupils' clothes	2019	11,480	285.39	3,276,279.78
	2020	12,750	324.37	4,135,704.63
Military boots	2019	5,850	145.43	850,763.67
	2020	6,780	172.49	1,169,468.51
Masks & hospital clothes	2019	50,000	1,242.99	62,149,439.10
	2020	66,000	1,679.09	110,819,711.54

Resource: prepared by the researcher

Table 3

The determination of the selling price of products

Model type		Manufacturing cost per unit	Profit margin	Price per unit
Military clothing (2 pieces)	2019	7,499.40	1,049.92	8,549.32
	2020	8,660.24	866.02	9,526.26
Security clothing (2 pieces)	2019	36,434.33	5,100.81	41,535.14
	2020	34,443.47	3,444.35	37,887.81
Clothing for corporate staff (2 pieces)	2019	50,557.76	7,078.09	57,635.84
	2020	48,644.76	4,864.48	53,509.24
Services companies (2 pieces)	2019	41,663.34	5,832.87	47,496.20
	2020	45,063.54	4,506.35	49,569.89
Trousers & jacket	2019	168,525.85	23,593.62	192,119.47
	2020	139,013.48	13,901.35	152,914.83
Jacket sport	2019	81,811.64	11,453.63	93,265.27
	2020	89,382.22	8,938.22	98,320.44
Pupils' clothes	2019	39,195.47	5,487.37	44,682.84
	2020	42,412.74	4,241.27	46,654.01
Military boots	2019	76,916.93	10,768.37	87,685.30
	2020	79,758.47	7,975.85	87,734.32
Masks & hospital clothes	2019	8,999.28	1,259.90	10,259.18
	2020	8,193.37	819.34	9,012.71

Resource: prepared by the researcher using Table 2

courses in universities and institutes. These training are for the purpose of preparing them scientifically and practically and thus developing their ability to deal with modern methods upon implementation.

The necessity of adopting the cost method on the basis of activities instead of relying on a single charge rate at the plant level in allocating indirect manufacturing costs because of the benefits that are achieved both at the level of measurement and control and the provision of information necessary for planning and decision-making.

There is a need to adopt the idea of the cost approach on the basis of activities, especially in light of price competition for products, as they have a significant impact on price flexibility and thus achieve competitive advantage for products.

The importance of clarifying the feasibility of applying the cost-based approach on the basis of activities in order to convince the plant management that this approach is the best solution in determining product prices through demonstrating the research sample.

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УЧЕТ КОСВЕННЫХ ПРОИЗВОДСТВЕННЫХ ЗАТРАТ НА ОСНОВЕ ДЕЯТЕЛЬНОСТИ (ABC) И АНАЛИЗ ИХ ВЛИЯНИЯ НА ЦЕНООБРАЗОВАНИЕ

В данной статье рассматривается применение косвенных производственных затрат в соответствии с системой затрат на основе видов деятельности и их влияние на ценообразование. Система учитывает затраты на основе действий современных систем учета затрат, которые используются для достижения уровня точности при определении косвенных производственных затрат за счет своей направленности, а также предоставляет новые методы контроля, которые способствуют сохранению косвенных затрат в организации и рационализации их использования и как это влияет на ценообразование. Важность исследования заключается в том, что оно направлено на выяснение косвенных производственных затрат и способов их распределения, а также на изучение системы калькуляции затрат на основе видов деятельности, которая направлена на более точное распределение косвенных затрат на продукты, особенно с учетом увеличения суммы косвенных затрат в результате технологического развития и помощи менеджменту в совершенствовании процесса ценообразования.

Ключевые слова: косвенные производственные затраты, управленческий учет, калькуляция затрат по видам деятельности, оценка, ценообразование.

ОБЛІК НЕПРЯМИХ ВИРОБНИЧИХ ВИТРАТ НА ОСНОВІ ДІЯЛЬНОСТІ (ABC) ТА АНАЛІЗ ЇХ ВПЛИВУ НА ЦІНОУТВОРЕННЯ

У статті досліджено та обґрунтовано підхід до розподілу непрямих виробничих витрат відповідно до методу на основі видів діяльності (ABC) та їх вплив на ціноутворення. Підхід до обліку непрямих виробничих витрат, заснований на калькуляції витрат на основі діяльності та аналіз їх впливу на ціноутворення, є свідченням розвитку бухгалтерської думки з метою подолання недоліків, які вплинули на традиційні методи ціноутворення, особливо в умовах сучасного промислового виробництва. Метод розподілу витрат на основі видів діяльності спрямований на досягнення визначеного рівня точності у визначенні непрямих виробничих витрат завдяки своїй спрямованості, а також забезпечує нові методи контролю, що сприяють збереженню непрямих витрат в організації та раціоналізації її використання. Важливість дослідження полягає в тому, що воно прагне пояснити непрямі виробничі витрати та способи їх розподілу та дослідити систему калькуляції витрат на основі видів діяльності, яка спрямована на розподіл непрямих витрат на продукцію, особливо з урахуванням збільшення загальної суми непрямих витрат в результаті технологічного розвитку та допомоги керівництву в удосконаленні процесу ціноутворення. Проблема дослідження полягає в тому, що некоректний розподіл непрямих витрат зумовлює створення додаткових одиниць продукції з часткою непрямих витрат, спотворюючи тим самим собівартість одиниці продукції. Такий результат калькулювання собівартості одиниці продукції зумовить некоректність визначення ціни, що вплине на зменшення обсягу продажів і, відповідно, суттєво знизить прибутковості діяльності суб'єкта господарювання. За відсутності точного вимірювання та надання інформації, необхідної для розподілу непрямих виробничих витрат за традиційними методами, використання методу ABC призведе до надання відповідної та точної інформації про витрати на продукцію, що сприятиме керівництву приймати правильні рішення щодо ціноутворення. Використання методу ABC сприяє підвищенню обізнаності про витрати для працівників виробничих підрозділів, а також точності оцінки та контролю витрат з метою формування інформації, необхідної для планування діяльності підприємства.

Ключові слова: непрямі виробничі витрати, управлінський облік, калькуляція витрат на основі діяльності, вимірювання, ціноутворення.