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Compatibility of Responsibility Accounting and the Performance-Based Activity Costing System (PF-ABC) for Improving Cost Management

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ABSTRACT

Objective: *This study aims to analyze the challenges inherent in traditional costing systems and to explore the integration of* ***Responsibility Accounting*** *and* ***Performance-Focused Activity-Based Costing (PF-ABC)*** *as contemporary approaches to enhance cost management and performance evaluation within industrial settings.* ***Method:*** *The research was conducted through an applied case study at the General Company for Electrical and Electronic Industries, focusing on the Electric Water Heater Production Line (80 and 120-liter models). Data were collected through on-site observations and financial performance analysis to identify inefficiencies and cost distortions.* ***Results:*** *Findings revealed that the manufacturing facility relied on outdated costing techniques, resulting in inflated production costs, frequent errors, and inefficiencies in operational processes. The application of Responsibility Accounting and PF-ABC demonstrated potential for more accurate cost allocation, enhanced managerial control, and improved performance evaluation.* ***Novelty:*** *This study contributes to management accounting literature by proposing a synergistic model that integrates Responsibility Accounting with PF-ABC, offering a modernized framework for cost management optimization and strategic decision-making in industrial enterprises.*

INTRODUCTION

Technological changes, and development of industrial organization environment, with a raft of challenges encompassed in economic activities, have forced the economic entities now to upgrade the accounting system to a more technically advanced level for controlling, and improving costs [1]. Thus, the situation has created a need for the advancement of systems in management accounting, with Responsibility Accounting, and the system of Performance-Focused Activity-Based Costing (PF-ABC) being among the most important; hence, they form the core systems for highly advanced resource management, and pinpoint-costing activities [2], [3]. These systems are highly useful in controlling, and optimizing costs by way of cuts on unnecessary, and non-value-adding expenditures. This study looks forward to highlighting the degree of compatibility between Responsibility Accounting, and PF-ABC, and investigating how this compatibility assists in the cost management of the economic unit.

RESEARCH METHOD

Section One: Research Methodology

1. Research Problem

The research problem can be formulated through the following key questions:

a. Can Responsibility Accounting systems, and methods, on the one hand, be considered as sources of information useful to a decision maker in taking a well-reasoned course of action that improves performance, and operational-outcomes? On the other hand, how does the implementation of the Performance-Focused Activity-Based Costing system contribute to increased effectiveness of Responsibility Accounting, and operational performance?
b. How much does the alignment between Responsibility Accounting and the PF-ABC system enhance cost management?

2. Research Objective

The study intends to focus on the influence of the application of Responsibility Accounting on evaluating industrial units, and improving their efficiency, and effectiveness. It also aims at presenting the idea, and procedural steps of the PF-ABC approach, identifying deviations, analyzing their causes, and emphasizing the adoption of modern management accounting tools within the Iraqi economic units. Finally, the study attempts to discuss the nature of the compatibility between the two systems [4].

3. Research Significance

The implementation of Responsibility Accounting under PF-ABC study, which supports better performance in executing the PF-ABC approach, serves as the thesis for this study. This integration instead should eliminate those conventional approaches that do not provide control information adequately for the analysis of activity efficiency, and effectiveness, and that do not sufficiently enhance cost management itself [5].

4. Research Hypothesis

Therefore, to justify the study aims, the following hypothesis is posited: There is a positive alignment of Responsibility Accounting with a PF-ABC system in managing cost, hence giving rise to the smooth functioning of cost contro,l and decision-making processes.

Section Two: Theoretical Framework of Responsibility Accounting and the Performance-Focused Activity-Based Costing (PF-ABC) System

1. The Concept of Responsibility Accounting

Responsibility Accounting is the system of dividing the organization into similar units to which definite responsibilities are assigned. These units could be departments, divisions, branches, or production lines. Each department consists of employees who are responsible, and answerable for some kind of administrative function or task. More particularly, Responsibility Accounting is a system whereby managers can associate a definite set of functions or objectives, and evaluate their actual performance. It is also called activity accounting or profit-accounting [6], [7], [8].

The modern idea of Responsibility Accounting can be understood as an approach in managerial accounting that defines an accounting framework in which performance can be monitored through direct linkage between accounting reports, and the responsible persons. The technique involves highlighting planned, and actual performance, drawing comparisons, identifying variances for which responsibility can be assigned, thereby

facilitating corrective managerial decisions [9], [10]. In keeping with the developments in management accounting, and information systems, Responsibility Accounting is seen as emerging to fulfill the needs of management to make the best use ofresources. It aims to create an industrial environment that can compete with others on productivity through new ideas, and optimal utilization of available resources, and energy [11].

2. The Importance of Responsibility Accounting

"Responsibility Accounting is a key instrument in the development of accounting in general, and management accounting in particular, for it is the act of accounting for revenues, and costs. This system helps to clarify who has been assigned responsibilities at each managerial level within the organizational structure of an economic unit" [12]. It offers reliable information about the standards of the economic unit in consideration of all stakeholders in, and outside the organization. "Such transparency increases the ability to make effective decisions regarding the unit's organizational, and operational matters" [13], [14].

"Moreover, as a system of accounting, it makes contributions toward control, measuring, and evaluation of performance on all the administrative levels with the end of achieving utmost utilization of available resources during a particular time frame" [15], [16]. "Secondly, it enhances internal coordination among various departments, and divisions, thus strengthening the ability of the unit to realize its strategic objectives. Responsibility Accounting, thus, forms an essential part of the organization's decision-making structure" [17].

Section Two (continued): Theoretical Framework of Responsibility Accounting and the Performance-Focused Activity-Based Costing (PF-ABC) System

3. The Concept of the PF-ABC System

Central to the Performance Focused Activity-Based Costing (PF-ABC) system formation stands the correlation between Activity-Based Costing (ABC), and Activity-Based Management (ABM). The two systems are closely related, since ABC is considered to be a two-dimensional model-a vertical dimension emphasizing cost allocation to cost objects, and a horizontal dimension that focuses on activities, and processes carried out within the organization [10]. Increasing focus on performance has led to the evolution of more integrated systems combining cost elements, operational procedures, and performance evaluations under the PF-ABC system. As cost systems have evolved, the need has been growing for accuracy in performance measurement. This gives rise to the managers' need to keep two interlinked subsystems: One for product costing, by estimating the actual cost of resources consumed by each activity according to cost drivers; and another for evaluation, and management that compares actual, and planned costs to assess activity productivity, and efficiency, and effectiveness deviations. The PF-ABC thus became a vital system by way of providing detailed information regarding costs for products, and services [4].

4. The Importance of the PF-ABC System

The importance of the PF-ABC system can be summarized in several key points:

a. Accurate identification of production capacity: With regard to the PF-ABC system, it offers necessary indicators concerning both utilized, and unutilized production capacity throughout all activities; hence being more precise in allocating costs for products, and services [12].
b. A mechanism of planning, performance evaluation, and cost allocation: It shows such deviations as efficiency, and effectiveness variances, and has shown its capability to eliminate many of the weaknesses of past systems such as ABC and TDABC [9].
c. The PF-ABC system could be able to identify valuable data concerning indirect costs. These data assist in the description, aggregation, and measurement of costs, and serve to further enhance cost control, as these methods do not restrict the processes of traditional costing [15].
d. Accurate cost allocation, and performance monitoring are true: It gives the opportunity to allocate indirect costs (advertising, operations, utilities, maintenance, technical support, etc.) accurately, and equitably to products, services, and customers. The system also allows monitoring of performance by measuring deviations as they occur from the standard path during operation [6].

RESULTS AND DISCUSSION

The Role of Responsibility Accounting and the PF-ABC Technique in Improving Cost Management

Cost management serves as one of the predominant pillars allowing for greater efficiency, and effectiveness of economic units. Within this context, several cost systems have been developed or have emerged for the enhancing of cost calculation in industrial entities [2]. Among these methods, Vice Accounting (RA) and PF-ABC have gained pride of place. These systems get along because they both try to improve cost management. In this method, each manager is made responsible for cost centers that relate to a given activity. More specifically, activities relating to each responsibility center are defined clearly, and costs related to such activities are assigned to that center [14].

This approach shifts management's emphasis from individual performance toward the functioning of the economic unit as an integrated system, and from mere cost controls toward the analysis of activities that cause costs. It also seeks to move from conforming to standards to continuous performance improvements (Martin, 1990, p. 3). Such integration clarifies weaknesses in overall performance. When PF-ABC outputs are linked to Responsibility Accounting reports, it becomes possible to identify departments or managers failing to meet efficiency standards or to detect activities within responsibility centers that are incurring inefficient costs [5]. Based on such integration, PF-ABC provides a clear system for monitoring, and managing cost behavior at the level

of economic units, while Responsibility Accounting assigns unequivocal responsibility for every cost incurred [10].

Section Three: The application of the compatibility between responsibility accounting and the PF-ABC system to enhance cost management in the General Company for Electrical, and Electronic Industries (Electric Water Heater Plant-Research Sample). In this section, the PF-ABC system is applied to the cost center of the Electric Water Heater Plant in the General Company for Electrical, and Electronic Industries. The steps of the application follow several key steps below.

1. Identifying the Main Activities in the Electric Water Heater Plant:

This stage is vital for distribution of costs into varied activities, similar to the first stage of the traditional Activity-Based Costing (ABC) system. Identifying, and classifying the main activities permit cost tracing to be more specific, and to comprehend resource consumption better. Concurrently, the activities of the Electric Water Heater Plant are divided into main operational activities which directly influence the production processes at the plant, as shown in the table below:

Table 1. Classification of Plant Activities

No.	Main Activity	Description of Activity	Required Resources
1	**Pressing (Cutting)**	Involves cutting the metal plates (billets) used in manufacturing the inner, and outer covers, as well as cutting the upper and lower lids.	Raw materials, labor, machines
2	**Turning (Lathe Work)**	Drilling the inner and outer covers to create inlets, and outlets for water, openings for the heater element, and shaping the related covers.	Raw materials, labor, machines
3	**Rolling**	Transforming the previously cut metal pieces into a cylindrical form.	Labor, machines
4	**Welding**	Welding the prepared parts, including the inner tank, outer cover, and upper and lower lids.	Raw materials, labor, machines
5	**Painting**	Coating the outer cover and inner tank using powder paint; the base is manually painted using air pressure, followed by painting the lids.	Raw materials, labor, machines
6	**Toning (Framing)**	Fixing the external frame using a specific type of screws.	Raw materials, labor
7	**Heater Installation**	Mounting the heating element in its designated place, sealing it with Teflon to prevent water leakage, and connecting the water outlet pipe.	Raw materials, labor, machines
8	**Assembly**	Assembling all prepared components of the electric water heater.	Labor, machines

No.	Main Activity	Description of Activity	Required Resources
9	**Insulation Material Application**	Cutting fiberglass insulation, wrapping it around the inner tank with adhesive tape, and creating holes for water and heater pipes.	Raw materials, labor, machines
10	**Inspection and Testing**	Testing the heater for water or electrical leakage, then adding the company logo and inlet/outlet labels to prepare the product for marketing.	Labor, machines

Source: Prepared by the researcher based on the field study and personal interviews with the engineers of the Electric Water Heater Plant.

2. Identification of the actual resources used in each activity

The actual resource costs required for each main activity identified in Step 1 are computed. Resources include direct materials needed to execute each activity, direct labor, and manufacturing overheads (indirect industrial costs). The allocation of indirect manufacturing costs to the main activities under PF-ABC is shown in the following table.

Table 2. Allocation of Indirect Manufacturing Costs to Main Activities (Amounts in IQD).

Cost Details	Basis of Allocation	Pressing (Cutting)	Turning (Lathe)	Rolling
Fuel and Oils	Utilization by the Industrial Services Dept.	791,250	791,250	633,000
Supplies and Tools	Cost Analysis	217,719.9	145,146.6	72,573.3
Water	Production Departments' Utilization	58,600.3	117,200.6	-
Electricity	Voltage Level	2,000,000	1,600,000	1,600,000
Building Depreciation	Cost Depreciation Analysis	200,000	200,000	200,000
Machinery and Equipment Depreciation	—	1,409,905	1,691,886	563,962
Tools and Molds Depreciation	—	432,800	-	216,400
Total		**5,110,275.2**	**4,545,483.2**	**3,285,935.3**
Cost Details	Basis of Allocation	Welding	Framing (Toning)	Painting
Fuel and Oils	Production Departments' Utilization	474,750	316,500	-

Cost Details	Basis of Allocation	Pressing (Cutting)	Turning (Lathe)	Rolling
Supplies and Tools	Cost Analysis	145,146.6	145,146.6	217,719.9
Water	Production Departments' Utilization	175,800.9	-	234,401.2
Electricity	Voltage Level	800,000	400,000	800,000
Building Depreciation	Cost Depreciation Analysis	200,000	200,000	200,000
Machinery and Equipment Depreciation	—	563,962	-	-
Tools and Molds Depreciation	—	541,000	432,800	541,000
Total		**2,900,659.5**	**1,494,446.6**	**1,993,121.1**
Cost Details	Basis of Allocation	Insulation Material	Heater Installation	Assembly
Fuel and Oils	Production Departments' Utilization	-	-	158,250
Supplies and Tools	Cost Analysis	290,293.2	72,573.3	72,573.3
Water	Production Departments' Utilization	-	-	-
Electricity	Voltage Level	-	-	400,000
Building Depreciation	Cost Depreciation Analysis	200,000	200,000	200,000
Machinery and Equipment Depreciation	—	-	-	-
Tools and Molds Depreciation	—	-	-	-
Total		**490,293.2**	**272,573.3**	**830,823.3**
Cost Details	Basis of Allocation	Quality Control Testing		Total
Fuel and Oils	Production Departments' Utilization	-		**3,165,000**
Supplies and Tools	Cost Analysis	72,573.3		**1,451,466**
Water	Production Departments' Utilization	-		**586,003**
Electricity	Voltage Level	400,000		**8,000,000**
Building Depreciation	Cost Depreciation Analysis	200,000		**2,000,000**

Cost Details	Basis of Allocation	Pressing (Cutting)	Turning (Lathe)	Rolling
Machinery and Equipment Depreciation	—		1,409,905	**5,639,620**
Tools and Molds Depreciation	—		-	**2,164,000**
Total			**2,082,478.3**	**23,006,089**

Source: Prepared by the researcher based on the detailed cost balance for the year 2024.

Table 3. Required Resources for Performing Direct and Indirect Main Activities (Amounts in IQD)

Main Activities	Direct Materials	Direct Labor	Indirect Manufacturing Costs (IMC)	Total
Pressing (Cutting)	2,225,656	40,404,000	5,110,275.2	47,739,931.2
Rolling	-	19,800,000	3,285,935.3	23,085,935.3
Turning (Lathe Work)	1,299,727	24,000,000	4,545,483.2	29,845,210.2
Framing (Toning)	2,482,480	5,040,000	1,494,446.6	9,016,926.6
Welding	2,215,010	28,200,000	2,900,659.5	33,315,669.5
Insulation Material	1,250,656	11,280,000	490,293.2	13,020,949.2
Painting	2,853,620	24,240,000	1,993,121.1	29,086,741.1
Assembly	1,183,262	36,000,000	830,823.3	38,014,085.3
Heater Installation	2,125,000	16,920,000	272,573.3	19,317,573.3
Quality Control Testing	1,875,000	19,800,000	2,082,478.3	23,757,478.3
Total	**17,510,411**	**225,684,000**	**23,006,089**	**266,200,500**

Source: Prepared by the researcher based on data from the Financial Affairs Department / Cost Division and Table (2).

3. Determining the Actual Rate for Each Activity Resource

Actual activity rates are computed as:

Actual rate for the activity = Actual costs of the activity ÷ Activity cost driver

Table 4. Computing Actual Rates for Main Activities' Costs

Main Activity	Cost Element	Cost Driver	Rate Formula	Actual Rate (IQD)
Pressing (Cutting)	Direct Materials	Quantity of billets used in heater manufacturing	2,225,656 ÷ 5,633 Kg	395
	Direct Labor	Actual labor hours	40,404,000 ÷ 14,472 hours	2,792

Main Activity	Cost Element	Cost Driver	Rate Formula	Actual Rate (IQD)
Rolling	IMC	Quantity of billets used in heater manufacturing	5,110,275.2 ÷ 5,633 Kg	970
	Direct Labor	Actual labor hours	19,800,000 ÷ 5,427 hours	3,648
	IMC	Actual labor hours	3,285,935.3 ÷ 5,427 hours	605
Turning (Lathe)	Direct Materials	Number of units produced	1,299,727 ÷ 186	6,988
	Direct Labor	Actual labor hours	24,000,000 ÷ 7,236 hours	3,317
	IMC	Actual labor hours	4,545,483.2 ÷ 7,236 hours	628
Framing (Toning)	Direct Materials	Quantity of materials entering the activity	2,482,480 ÷ 2,046 pcs	1,213
	Direct Labor	Actual labor hours	5,040,000 ÷ 1,809 hours	2,786
	IMC	Actual labor hours	1,494,446.6 ÷ 1,809 hours	826
Welding	Direct Materials	Quantity of materials entering the activity	2,215,010 ÷ 70 Kg	31,643
	Direct Labor	Actual labor hours	28,200,000 ÷ 9,045 hours	3,118
	IMC	Actual labor hours	2,900,659.5 ÷ 9,045 hours	321
Insulation Material	Direct Materials	Meters of insulation material	1,250,656 ÷ 111.65 m	11,202
	Direct Labor	Actual labor hours	11,280,000 ÷ 3,618 hours	3,118
	IMC	Actual labor hours	490,293.2 ÷ 3,618 hours	136
Painting	Direct Materials	Quantity of materials entering the activity	2,853,620 ÷ 116 L	24,600
	Direct Labor	Actual labor hours	24,240,000 ÷ 7,236 hours	3,350
	IMC	Actual labor hours	1,993,121.1 ÷ 7,236 hours	275
Assembly	Direct Materials	Quantity of materials entering the activity	1,183,262 ÷ 5,022 pcs	236
	Direct Labor	Actual labor hours	36,000,000 ÷ 9,045 hours	3,980
	IMC	Actual labor hours	830,823.3 ÷ 9,045 hours	92
Heater Installation	Direct Materials	Number of units produced	2,125,000 ÷ 186	11,425
	Direct Labor	Actual labor hours	16,920,000 ÷ 5,427 hours	3,118
	IMC	Actual labor hours	272,573.3 ÷ 5,427 hours	50
Quality Control Testing	Direct Materials	Number of units produced	1,875,000 ÷ 186	10,081

Main Activity	Cost Element	Cost Driver	Rate Formula	Actual Rate (IQD)
	Direct Labor	Actual labor hours	19,800,000 ÷ 5,427 hours	3,648
	IMC	Number of test runs	2,082,478.3 ÷ 558 runs	3,732

Source: Prepared by the researcher based on Table (3).

4. Determining the cost of each activity

Actual cost = Actual quantity of resources consumed × Actual resource rate

Table 5. Cost of Main Activities (Amounts in IQD)

Activity	Resource	Cost Driver	Actual Quantity	Actual Rate (IQD)	Actual Cost (IQD)
Pressing (Cutting)	Direct Materials	Total billets quantity	25 Kg × 18 + 28 Kg × 168	395	2,035,830
Pressing (Cutting)	Direct Labor	Hourly wage rate	0.067 × 186 hours	2,792	34,794
Pressing (Cutting)	IMC	Total billets quantity	25 Kg × 18 + 28 Kg × 168	970	4,999,380
Rolling	Direct Labor	Hourly wage rate	186 × 0.06 hours	3,648	40,712
Rolling	IMC	Hourly wage rate	186 × 0.06 hours	605	6,752
Turning (Lathe)	Direct Materials	Units produced	186	6,988	1,299,768
Turning (Lathe)	Direct Labor	Hourly wage rate	186 × 0.034 hours	3,317	20,977
Turning (Lathe)	IMC	Hourly wage rate	186 × 0.034 hours	628	3,971
Framing (Toning)	Direct Materials	Materials used in activity	2,046	1,213	2,481,798
Framing (Toning)	Direct Labor	Hourly wage rate	186 × 0.118 hours	2,786	61,147
Framing (Toning)	IMC	Hourly wage rate	186 × 0.118 hours	826	18,129
Welding	Direct Materials	Materials used in activity	18 × 0.75 Kg + 0.837 Kg × 168	31,643	4,876,693
Welding	Direct Labor	Hourly wage rate	186 × 0.084 hours	3,118	48,716
Welding	IMC	Hourly wage rate	186 × 0.084 hours	321	5,015
Insulation	Direct Materials	Meters of insulation	18 × 1.25 m + 1.45 m × 168	11,202	2,980,852
Insulation	Direct Labor	Hourly wage rate	186 × 0.134 hours	3,118	77,713
Insulation	IMC	Hourly wage rate	186 × 0.134 hours	136	3,390

Activity	Resource	Cost Driver	Actual Quantity	Actual Rate (IQD)	Actual Cost (IQD)
Painting	Direct Materials	Materials used in activity	18 × 1.25 L + 2 L × 168	24,600	8,819,100
Painting	Direct Labor	Hourly wage rate	186 × 0.066 hours	3,350	41,125
Painting	IMC	Hourly wage rate	186 × 0.066 hours	275	3,376
Assembly	Direct Materials	Units produced	186	236	43,896
Assembly	Direct Labor	Hourly wage rate	186 × 1 hour	3,980	740,280
Assembly	IMC	Hourly wage rate	186 × 1 hour	92	17,112
Heater Installation	Direct Materials	Units produced	186 × 1 heater	11,425	2,125,050
Heater Installation	Direct Labor	Hourly wage rate	186 × 0.06 hours	3,118	34,797
Heater Installation	IMC	Hourly wage rate	186 × 0.06 hours	50	558
Quality Control Testing	Direct Materials	Units produced	186	10,081	1,875,066
Quality Control Testing	Direct Labor	Hourly wage rate	0.667 × 186 hours	3,648	452,578
Quality Control Testing	IMC	Number of tests	186 × 3 runs	3,732	2,082,456

Source: Prepared by the researcher based on Table (4).

5. Computing the standard rate for each activity

Standard rates were set in consultation with the plant engineers, and the Cost Division.

Table 6. Standard resources required for main activities (direct and indirect) — Amounts in IQD

Main Activity	Direct Materials	Direct Labor	Indirect Manufacturing Costs (IMC)	Total
Pressing (Cutting)	15,012,589	36,433,580	21,675,367	73,121,536
Rolling	—	19,494,250	18,726,200	38,220,450
Turning (Lathe)	1,125,400	23,232,000	16,648,254	41,005,654
Framing (Toning)	1,876,000	10,447,700	11,270,259	23,593,959
Welding	2,133,574	15,856,000	26,874,481	44,864,055
Insulation Material	1,661,845	8,176,000	23,354,833	33,192,678
Painting	6,453,155	16,808,000	25,174,841	48,435,996
Assembly	1,123,483	24,782,937	15,286,500	41,192,920

Heater Installation	1,110,000	10,354,393	13,753,446	25,217,839
Quality Control Testing	1,595,650	19,058,745	20,147,949	40,802,344
Total	**32,091,696**	**184,643,605**	**192,912,130**	**409,647,431**

Source: General Company for Electrical and Electronic Industries / Cost Division / Planning and Follow-up Department.

6. Computing the standard rate for each activity
Standard rate = Standard costs of the activity ÷ Activity cost driver

Table 7. Standard rate calculation for main activities (Amounts in IQD)

Main Activity	Cost Element	Cost Driver	Standard-rate Formula	Standard Rate (IQD)
Pressing (Cutting)	Direct Materials	Billets used in manufacturing	15,012,589 ÷ 38,850 Kg	386
	Direct Labor	Standard labor hours	36,433,580 ÷ 14,168 hours	2,572
	IMC	Billets used in manufacturing	21,675,367 ÷ 38,850 Kg	558
Rolling	Direct Labor	Standard labor hours	19,494,250 ÷ 5,313 hours	3,669
	IMC	Standard labor hours	18,726,200 ÷ 5,313 hours	3,525
Turning (Lathe)	Direct Materials	Units produced	1,125,400 ÷ 875 units	1,286
	Direct Labor	Standard labor hours	23,232,000 ÷ 7,084 hours	3,280
	IMC	Standard labor hours	16,648,254 ÷ 7,084 hours	2,350
Framing (Toning)	Direct Materials	Quantity of items used	1,876,000 ÷ 9,625 screws	195
	Direct Labor	Standard labor hours	10,447,700 ÷ 1,771 hours	5,899
	IMC	Standard labor hours	11,270,259 ÷ 1,771 hours	6,364
Welding	Direct Materials	Quantity of materials	2,133,574 ÷ 354.7 Kg	6,015
	Direct Labor	Standard labor hours	15,856,000 ÷ 8,855 hours	1,791
	IMC	Standard labor hours	26,874,481 ÷ 8,855 hours	3,035
Insulation Material	Direct Materials	Meters of insulation	1,661,845 ÷ 608.5 m	2,731
	Direct Labor	Standard labor hours	8,176,000 ÷ 3,542 hours	2,308

Main Activity	Cost Element	Cost Driver	Standard-rate Formula	Standard Rate (IQD)
Painting	IMC	Standard labor hours	23,354,833 ÷ 3,542 hours	6,594
	Direct Materials	Quantity of materials	6,453,155 ÷ 835.6 L	7,723
	Direct Labor	Standard labor hours	16,808,000 ÷ 7,084 hours	2,373
Assembly	IMC	Standard labor hours	25,174,841 ÷ 7,084 hours	3,554
	Direct Materials	Quantity used	1,123,483 ÷ 23,625 pcs	48
	Direct Labor	Standard labor hours	24,782,937 ÷ 8,855 hours	2,799
Heater Installation	IMC	Standard labor hours	15,286,500 ÷ 8,855 hours	1,726
	Direct Materials	Standard units produced	1,110,000 ÷ 875 units	1,269
	Direct Labor	Standard labor hours	10,354,393 ÷ 5,313 hours	1,949
Quality Control Testing	IMC	Standard labor hours	13,753,446 ÷ 5,313 hours	2,589
	Direct Materials	Standard units produced	1,595,650 ÷ 875 units	1,824
	Direct Labor	Standard labor hours	19,058,745 ÷ 5,313 hours	3,587
	IMC	Number of test runs	20,147,949 ÷ 5,250 runs	3,834

Source: Prepared by the researcher based on Table (6).

7. Calculating the Activity Price Variance

Activity Price Variance = Actual Cost − (Actual Resource × Standard Price)

Table 8. Calculation of Price Variance for Main Activities (Amounts in IQD)

Main Activity	Resource	Price Variance Formula	Variance Amount	Variance Type
Pressing (Cutting)	Direct Materials	2,035,830 − (5,154 × 386)	46,386	Unfavorable (FC < AC)
	Direct Labor	34,794 − (12 × 2,572)	3,930	Unfavorable (FC < AC)
	IMC	4,999,380 − (5,154 × 558)	2,123,448	Unfavorable (FC < AC)
	Direct Labor	40,712 − (11 × 3,669)	353	Unfavorable (FC < AC)
	IMC	6,752 − (11 × 3,525)	32,023	Favorable (AC < FC)

Main Activity	Resource	Price Variance Formula	Variance Amount	Variance Type
Turning (Lathe)	Direct Materials	1,299,768 − (186 × 1,286)	1,060,572	Unfavorable (FC < AC)
	Direct Labor	20,977 − (6 × 3,280)	1,297	Unfavorable (FC < AC)
	IMC	3,971 − (6 × 2,350)	10,129	Favorable (AC < FC)
Framing (Toning)	Direct Materials	2,481,798 − (2,046 × 195)	2,082,828	Unfavorable (FC < AC)
	Direct Labor	61,147 − (22 × 5,899)	68,631	Favorable (AC < FC)
	IMC	18,129 − (22 × 6,364)	121,879	Favorable (AC < FC)
Welding	Direct Materials	4,876,693 − (154 × 6,015)	3,950,383	Unfavorable (FC < AC)
	Direct Labor	48,716 − (16 × 1,791)	20,060	Unfavorable (FC < AC)
	IMC	5,015 − (16 × 3,035)	43,545	Favorable (AC < FC)
Insulation Material	Direct Materials	2,980,852 − (266 × 2,731)	2,254,406	Unfavorable (FC < AC)
	Direct Labor	77,713 − (25 × 2,308)	20,013	Unfavorable (FC < AC)
	IMC	3,390 − (25 × 6,594)	161,460	Favorable (AC < FC)
Painting	Direct Materials	8,819,100 − (359 × 7,723)	6,046,543	Unfavorable (FC < AC)
	Direct Labor	41,125 − (12 × 2,373)	12,649	Unfavorable (FC < AC)
	IMC	3,376 − (12 × 3,554)	39,272	Favorable (AC < FC)
Assembly	Direct Materials	43,896 − (186 × 48)	34,968	Unfavorable (FC < AC)
	Direct Labor	740,280 − (186 × 2,799)	219,666	Unfavorable (FC < AC)
	IMC	17,112 − (186 × 1,726)	303,924	Favorable (AC < FC)
Heater Installation	Direct Materials	2,125,050 − (186 × 1,269)	1,889,016	Unfavorable (FC < AC)
	Direct Labor	34,797 − (11 × 1,949)	13,358	Unfavorable (FC < AC)
	IMC	558 − (11 × 2,589)	27,921	Favorable (AC < FC)
Quality Control Testing	Direct Materials	1,875,066 − (186 × 1,824)	1,535,802	Unfavorable (FC < AC)

Main Activity	Resource	Price Variance Formula	Variance Amount	Variance Type
	Direct Labor	452,578 − (124 × 3,587)	7,790	Unfavorable (FC < AC)
	IMC	2,082,456 − (558 × 3,834)	56,916	Favorable (AC < FC)

Source: Prepared by the researcher based on Tables (5) and (7).

8. Calculating the costs of executed activities

Cost per activity = Standard resource × (Actual work × Standard price)

Table 9. Costs of Executed Main Activities (Amounts in IQD)

Activity	Resource	(Standard price × Actual work performed) × Standard resource	Cost of Executed Activities (IQD)
Pressing (Cutting)	Direct Materials	386 × (18 × 25 kg) + 386 × (168 × 28 kg)	1,989,444
	Direct Labor	2,572 × (186 × 0.05 hr)	23,920
	IMC	558 × (18 × 25 kg) + 558 × (168 × 28 kg)	2,875,932
Rolling	Direct Labor	3,669 × (186 × 0.05 hr)	34,122
	IMC	3,525 × (186 × 0.05 hr)	32,783
Turning (Lathe)	Direct Materials	1,286 × (186 × 1)	239,196
	Direct Labor	3,280 × (186 × 0.032 hr)	19,522
	IMC	2,350 × (186 × 0.032 hr)	13,988
Framing (Toning)	Direct Materials	195 × (186 × 11 screws)	398,970
	Direct Labor	5,899 × (186 × 0.1 hr)	109,721
	IMC	6,364 × (186 × 0.1 hr)	118,370
Welding	Direct Materials	6,015 × [18 × 0.75 kg + 0.837 kg × 168]	926,310
	Direct Labor	1,791 × (186 × 0.067 hr)	22,319
	IMC	3,035 × (186 × 0.067 hr)	37,822
Insulation Material	Direct Materials	2,731 × [18 × 1.25 m + 1.45 m × 168]	726,719
	Direct Labor	2,308 × (186 × 0.1 hr)	42,929
	IMC	6,594 × (186 × 0.1 hr)	122,648
Painting	Direct Materials	7,723 × [18 × 1.25 L + 2 L × 168]	2,768,696

Activity	Resource	(Standard price × Actual work performed) × Standard resource	Cost of Executed Activities (IQD)
Assembly	Direct Labor	2,373 × (186 × 0.053 hr)	23,393
	IMC	3,554 × (186 × 0.053 hr)	35,035
	Direct Materials	48 × (186 × 27 pcs)	241,056
Heater Installation	Direct Labor	2,799 × (186 × 0.75 hr)	390,461
	IMC	1,726 × (186 × 0.75 hr)	240,777
	Direct Materials	1,269 × (186 × 1 heater)	236,034
Quality Control Testing	Direct Labor	1,949 × (186 × 0.05 hr)	18,126
	IMC	2,589 × (186 × 0.05 hr)	24,078
	Direct Materials	1,824 × (186 × 1)	339,264
	Direct Labor	3,587 × (186 × 0.65 hr)	433,668
	IMC	3,834 × (186 × 3 runs)	2,139,372

Source: Prepared by the researcher based on Table (7).

9. Calculating the Quantity Variance

This step, not found in the first and second stages of the ABC system, considers the flexible budget and executed resources.

The formula applied is:

Quantity Variance = (Actual Quantity of Resources × Standard Price) − (Standard Quantity for Actual Production × Standard Price)

Table 10. Calculation of Quantity Variance for Main Activities (Amounts in IQD)

Main Activity	Resource	Quantity Variance Formula	Variance Amount	Variance Type
Pressing (Cutting)	Direct Materials	(5,154 × 386) − (5,154 × 386)	0	No variance
	Direct Labor	(12 × 2,572) − (9 × 2,572)	7,716	Unfavorable (AR < FB)
	IMC	(5,154 × 558) − (5,154 × 558)	0	No variance
	Direct Labor	(11 × 3,669) − (9 × 3,669)	7,338	Unfavorable (AR < FB)
	IMC	(11 × 3,525) − (9 × 3,525)	7,050	Unfavorable (AR < FB)
Turning (Lathe)	Direct Materials	(186 × 1,286) − (186 × 1,286)	0	No variance

Main Activity	Resource	Quantity Variance Formula	Variance Amount	Variance Type
Framing (Toning)	Direct Labor	(6 × 3,280) − (5 × 3,280)	3,280	Unfavorable (AR < FB)
	IMC	(6 × 2,350) − (5 × 2,350)	2,350	Unfavorable (AR < FB)
	Direct Materials	(2,046 × 195) − (2,046 × 195)	0	No variance
	Direct Labor	(22 × 5,899) − (19 × 5,899)	17,697	Unfavorable (AR < FB)
	IMC	(22 × 6,364) − (19 × 6,364)	19,092	Unfavorable (AR < FB)
Welding	Direct Materials	(154 × 6,015) − (154 × 6,015)	0	No variance
	Direct Labor	(16 × 1,791) − (12 × 1,791)	7,164	Unfavorable (AR < FB)
	IMC	(16 × 3,035) − (12 × 3,035)	12,140	Unfavorable (AR < FB)
Insulation Material	Direct Materials	(266 × 2,731) − (266 × 2,731)	0	No variance
	Direct Labor	(25 × 2,308) − (19 × 2,308)	13,848	Unfavorable (AR < FB)
	IMC	(25 × 6,594) − (19 × 6,594)	39,564	Unfavorable (AR < FB)
Painting	Direct Materials	(359 × 7,723) − (359 × 7,723)	0	No variance
	Direct Labor	(12 × 2,373) − (10 × 2,373)	4,746	Unfavorable (AR < FB)
	IMC	(12 × 3,554) − (10 × 3,554)	7,108	Unfavorable (AR < FB)
Assembly	Direct Materials	(186 × 48) − (186 × 48)	0	No variance
	Direct Labor	(186 × 2,799) − (140 × 2,799)	128,754	Unfavorable (AR < FB)
	IMC	(186 × 1,726) − (140 × 1,726)	79,396	Unfavorable (AR < FB)
Heater Installation	Direct Materials	(186 × 1,269) − (186 × 1,269)	0	No variance
	Direct Labor	(11 × 1,949) − (9 × 1,949)	3,898	Unfavorable (AR < FB)
	IMC	(11 × 2,589) − (9 × 2,589)	5,178	Unfavorable (AR < FB)
Quality Control Testing	Direct Materials	(186 × 1,824) − (186 × 1,824)	0	No variance
	Direct Labor	(124 × 3,587) − (121 × 3,587)	10,761	Unfavorable (AR < FB)

Main Activity	Resource	Quantity Variance Formula	Variance Amount	Variance Type
	IMC	(558 × 3,834) − (558 × 3,834)	0	No variance

Source: Prepared by the researcher.

10. Calculating the Productivity of Each Activity

This is the final stage of the PF-ABC system, where activity productivity is determined using the following equation:

Activity Productivity = Efficiency Variance + Effectiveness Variance

Table 11. Calculation of Effectiveness Variance for Main Activities (Amounts in IQD)

Main Activity	Resource	Effectiveness Variance Formula (Executed Cost − Planned Cost)	Variance Amount (IQD)	Variance Type
Pressing (Cutting)	Direct Materials	(1,989,444 − 14,996,100)	13,006,656	Budget < Executed → Unfavorable
	Direct Labor	(23,920 − 112,525)	88,605	Budget < Executed → Unfavorable
	IMC	(2,875,932 − 14,996,100)	12,120,168	Budget < Executed → Unfavorable
Rolling	Direct Labor	(34,122 − 160,519)	126,397	Budget < Executed → Unfavorable
	IMC	(32,783 − 154,219)	121,436	Budget < Executed → Unfavorable
Turning (Lathe)	Direct Materials	(239,196 − 2,870,000)	2,630,804	Budget < Executed → Unfavorable
	Direct Labor	(19,522 − 91,840)	72,318	Budget < Executed → Unfavorable
	IMC	(13,988 − 65,800)	51,812	Budget < Executed → Unfavorable
Framing (Toning)	Direct Materials	(398,970 − 1,876,875)	1,477,905	Budget < Executed → Unfavorable

Main Activity	Resource	Effectiveness Variance Formula (Executed Cost − Planned Cost)	Variance Amount (IQD)	Variance Type
Welding	Direct Labor	(109,721 − 516,163)	406,442	Budget < Executed → Unfavorable
	IMC	(118,370 − 556,850)	438,480	Budget < Executed → Unfavorable
	Direct Materials	(926,310 − 2,133,521)	1,207,211	Budget < Executed → Unfavorable
Insulation Material	Direct Labor	(22,319 − 104,997)	82,678	Budget < Executed → Unfavorable
	IMC	(37,822 − 177,927)	140,105	Budget < Executed → Unfavorable
	Direct Materials	(726,719 − 1,661,814)	935,095	Budget < Executed → *Favorable*
Painting	Direct Labor	(42,929 − 201,950)	159,021	Budget < Executed → Unfavorable
	IMC	(122,648 − 576,975)	454,327	Budget < Executed → Unfavorable
	Direct Materials	(2,768,696 − 6,453,339)	3,684,643	Budget < Executed → Unfavorable
Assembly	Direct Labor	(23,393 − 110,048)	86,655	Budget < Executed → Unfavorable
	IMC	(35,035 − 164,817)	129,782	Budget < Executed → Unfavorable
	Direct Materials	(241,056 − 1,134,000)	892,944	Budget < Executed → Unfavorable
	Direct Labor	(390,461 − 1,836,844)	1,446,383	Budget < Executed → Unfavorable
	IMC	(240,777 − 1,132,688)	891,911	Budget < Executed → Unfavorable

Main Activity	Resource	Effectiveness Variance Formula (Executed Cost − Planned Cost)	Variance Amount (IQD)	Variance Type
Heater Installation	Direct Materials	(236,034 − 1,110,375)	874,341	Budget < Executed → Unfavorable
	Direct Labor	(18,126 − 85,269)	67,143	Budget < Executed → Unfavorable
	IMC	(24,078 − 113,269)	89,191	Budget < Executed → Unfavorable
Quality Control Testing	Direct Materials	(339,264 − 1,596,000)	1,256,736	Budget < Executed → Unfavorable
	Direct Labor	(433,668 − 2,040,106)	1,606,438	Budget < Executed → Unfavorable
	IMC	(2,139,372 − 10,064,250)	7,924,878	Executed < Budget → Unfavorable

Source: Prepared by the researcher based on Tables (8) and (10).

CONCLUSION

Fundamental Finding : The study concludes that the General Company for Electrical and Electronic Industries' reliance on traditional costing methods hinders its ability to adapt to the evolving business environment, whereas the integration of **Responsibility Accounting** and **Performance-Focused Activity-Based Costing (PF-ABC)** provides a more accurate, data-driven foundation for managerial decision-making. The combined application of these systems significantly improves cost control, enhances performance evaluation, and transforms operations from loss to profitability. **Implication :** The findings underscore the strategic importance of adopting modern management accounting frameworks to optimize resource utilization, strengthen accountability, and improve financial performance within manufacturing enterprises. **Limitation :** This research is limited to a single production line within one industrial company, which may constrain the generalizability of the results to other sectors or organizational contexts. **Future Research :** Further studies should expand the analysis to multiple industries, incorporate longitudinal assessments to measure sustained performance improvements, and explore digital integration of PF-ABC and Responsibility Accounting systems through advanced analytics and automation.

REFERENCES

[1] A. M. Al-Tair, I. M. Al-Nihawi, and O. S. Azzouza, "The Indirect Relationship Between the Application of Responsibility Accounting System and the Improvement of Financial Performance Through Competitive Advantage in Libyan Institutions," *Journal of Economic and Business Studies*, vol. 8, no. 1, 2021.

[2] A. R. O. A. Mohammed and F. I. K. Hasb Allah, "The Role of Responsibility Accounting System in Evaluating and Improving Performance in Industrial Enterprises: A Field Study on Khartoum Refinery Company Ltd. (2020–2022)," *Al-Qulzum Scientific Journal for Economic and Social Studies*, vol. 14, 2022, pp. 7–38.

[3] S. M. A. Al-Shibli, "Measuring Costs Based on Performance-Focused Activities to Improve Profitability: An Applied Study," M.S. thesis, Univ. of Al-Qadisiyah, Iraq, 2017.

[4] A. M. A. Al-Sayyid, Y. Z. Al-Shafei, and M. A. Abu Shiyaa, "Using the Performance-Focused Activity-Based Costing System in Just-in-Time Context to Improve Health Service Cost Measurement: A Field Study," *Journal of Contemporary Commercial Studies*, vol. 7, no. 5, 2019.

[5] M. H. F. Al-Obaidi and H. Y. Al-Jarjari, "Using the Performance-Focused Activity-Based Costing (PF-ABC) Method in Measuring the Cost of Health Services: An Applied Study in Ibn Al-Atheer Teaching Hospital for Children," *Nottingham University Journal for Administrative and Human Sciences*, vol. 4, no. 2, 2024.

[6] A. M. H. Al-Miyali, "Using the Performance-Focused Activity-Based Costing Technique to Evaluate Performance in Economic Units," M.S. thesis, College of Administration and Economics, Univ. of Baghdad, Iraq, 2020.

[7] N. A. Al-Kur'awi, "Advantages and Problems of Integrating Responsibility Accounting System with Activity-Based Costing System," *Al-Qadisiyah Journal for Administrative and Economic Sciences*, vol. 11, no. 4, 2009.

[8] A. A.-H. H. Al-Zameli, A. G. M. Al-Zubaidi, and A. S. Agrab, "The Application of Performance-Focused Activity-Based Costing (PFABC) and its Role in Measuring the Cost of Banking Services and Improving Performance (An Applied Study in Al-Rafidain Bank / Al-Diwaniyah Branch)," *International Academic Journal of Social Sciences*, vol. 9, no. 1, 2022.

[9] T. Biswas, "Responsibility Accounting: A Review of Related Literature," *International Journal of Multidisciplinary Research and Development*, vol. 4, no. 8, pp. 202–206, 2017.

[10] A. S. Husayn and S. M. Al-Mahdawi, "The Role of Responsibility Accounting in Monitoring and Evaluating Performance in Commercial Banks in Libya," *Al-Qurtas Journal*, Faculty of Economics and Political Science, University of Al-Zaytouna, no. 13, Apr. 2021.

[11] N. R. Khurana, "Importance of Responsibility Accounting in an Organizational Framework," *International Journal of Business and Management Innovation (IJBMI)*, vol. 9, no. 7, pp. 24–32, 2022.

[12] I. Nykyforak, N. Duhanets, and Y. Kobrusieva, "Organization of Responsibility Accounting of City Electric Transport Enterprises' Activity," *Eastern-European Journal of Enterprise Technologies*, vol. 2, no. 3(92), pp. 31–36, 2018.

[13] A. H. Mahaoush, "The Role of PFABC in Controlling Health Services Costs and Increasing Profitability in Private Hospitals," *Anbar University Journal of Economic and Administrative Sciences*, vol. 16, no. 2, 2024.

[14] H. H. K. Tin, "A Comparative Analysis of Cost-Volume-Profit (CVP) Analysis and Activity-Based Costing (ABC) in Improving Managerial Decision-Making," *Commerce and Trade Management: An International Journal (ECTIJ)*, vol. 3, 2023.

[15] D. Porter, *Managerial Accounting*. Tidewater Community College, 2017. [Online]. Available: https://s3.amazonaws.com/lumenlearning/success/Master+PDFs/Financial-Accounting.pdf

[16] J. R. Martin, "Interdependence and Control: Traditional vs. Activity-Based Responsibility Accounting," *Journal of Cost Management*, pp. 15–23, 1990.

[17] O. E. O. K. Atu, E. Ogbeide, I. S. Agbo, and C. E. Ozele, "Responsibility Accounting: An Overview," *IOSR Journal of Business and Management*, vol. 16, no. 1, pp. 73–79, 2014.

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