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The Role of Time-Directed Resource Consumption Accounting Technology in Monitoring and Reducing Product Costs: An Applied Study

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ABSTRACT :The research aims to apply the time-oriented resource consumption accounting (TDRCA) technique in one of the factories of the Iraqi General Cement Company / Kufa Cement Factory, as it is one of the most important strategic cost management techniques in the field of administrative and cost accounting, and that the application of this technology would lead to efficient utilization of resources And achieve control over it and thus lead to a reduction in costs, and to achieve this goal, the two researchers conducted a case study of the research sample represented in the Kufa Cement Factory, relying on the data of the economic unit through personal interviews and field visits with the employees of the Kufa Cement Factory and field visits for the purpose of applying the technology, and it was reached To a set of conclusions, the most important of which is: that the application of time-oriented resource consumption accounting contributes to the optimal utilization of resources and achieving control over them, and this is reflected in the result in reducing costs. The advantages of (TDABC) technology and (GPK) technology in order to rationalize the resources of the economic unit, and to achieve control over them, as well as taking Strategic Decisions The results of the research concluded that the ability of this technology to identify and distribute costs in an easier and less complicated way and reduce effort and time, to achieve the best control over costs.

Keywords: Time-Oriented Resource Consumption Accounting (TDRCA), cost reduction**.**

I. INTRODUCTION

Theresearch aims to achieve the following , The role of time-directed resource consumption accounting technology in managing cost reduction and enhancing competitiveness. Demonstrate the role of applying time-oriented resource consumption accounting technology in Optimizing the use of available resources and identifying idle energy and its reflection as a result in cost management in the economic unit Research Sample. The importance of research stems from the extent to which economic units need Apply techniques within the scope of contemporary strategic cost management, including in particular, time-oriented resource consumption accounting technology that helps reduce costs and control the resources of economic units and exploitation. optimized for those resources. In a way that contributes to cost management. The problem of research is that developments in the business environment and challenges as a result of technological progress and intense competition and global openness For markets, traditional Cal vocal systems have been rendered incapable of Provide appropriate information that helps economic units reduce costs for the product and in particular meet new requirements that allow them to continue to The shadow of these developments in that environment, which negatively affected Its productivity and as a result its sales decrease as a result of not applying Modern cost management techniques. The research is based on the main hypothesis that: (The application of time oriented resource consumption accounting techniqu e leads to To provide information that would contribute to reducing costs in the economic unit of the research sample and in a manner that suits the requirements of the contemporary business environment).

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Table (1) Shows the definitions of resource consumption accounting\

Researcher Name	Year: page	Definition
(Datar &Rajan)	2021:661	A modern management accounting technique, which uses procedures similar to those used in the process of charging the cost to products, where the determination of fixed cost charging rates is based on the practical capacity while the determination of proportional cost charging rates (i.e. costs that vary according to the outputs of the resource pool) is based on the planned quantities.
Ali Page	2021:42	One of the contemporary cost accounting techniques that is characterized by comprehensiveness and its dynamic ability to manage costs in order to provide appropriate information that would help in employing the available resources and exploiting them efficiently and effectively, and as a result, addressing idle energy in a way that contributes to managing and rationalizing costs.

II. LITERATURE REVIEW

The First topic: the cognitive foundations of accounting technique TDRCA resource consu mption

First: The concept and definition of resource consumption accounting

The technique of accounting for resource consumption RCA is one of the contemporary techniques for cost management, which seeks to provide appropriate information on how to optimize the use of available resources and employ idle energy in a way that contributes to increasing productivity and reducing costs for the product or service and thus increasing the profits of the economic unit and strengthening its competitive position, and given the importance of resource consumption accounting technology, it has been addressed by many researchers and those interested in their research and studies, but they did not agree on A specific and comprehensive concept of this technology, and many definitions have been received about it, and in this regard some of them can be highlighted as follows:

Based on the above, the researchers can provide a definition of resource consumption accounting (RCA), which is an accounting technique that gives a future view of resource consumption in order to achieve the interests, desires and needs of customers according to the resource needs of activities, with a focus on the need for optimal use. for resources. To achieve effective and efficient energy management. Which provides appropriate information on how to efficiently and optimally use the available resources and use idle energy to help increase productivity and reduce product costs, thus increasing the profits of the enterprise and supporting its competitive position through the following:

a) Input allocates resources to products by calculating the cost and percentage of resources used.

b) It aims to provide a future vision of how to optimize the use of the resources and activities of the facility.

c) Technology as a control input on the elements of resource consumption accounting.

Second: Objectives of RCA

The main objective of adopting the technique of accounting for resource consumption is to improve the use of resources of the economic unit and to reduce production costs and meet the requirements of customers, and thus support the competitive position of the economic unit, and there is a set of important objectives mentioned in the accounting literaturefor resource consumption accounting tech nology represented in the following:

Providing financial and non-financial information through an operational model with a future dimension that contributes to the process of predicting the requirements of each other resource and identifying idle energy and not loading it on products that have never caused it to occur (Sorour,2019: 115).

1. Clarify how to use the flexible budget at the cost center level for planning and control purposes The technology also provides this information necessary to support the decision-making process and for all administrative levels (Mamouri,2020:396-397).

2. The aim is to achieve the best possible utilization of available resources in the economic unit, which leads to cost reduction, adds value for the customer, and supports the competitive position of

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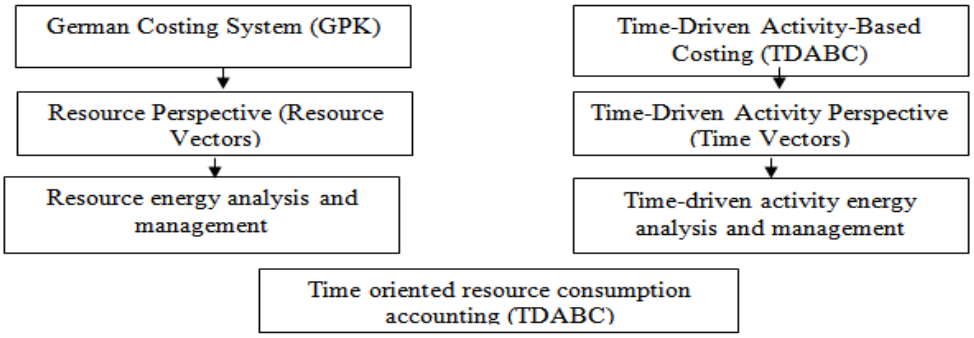
the economic unit. Additionally, it aims to provide fundamental information about the economic unit's resources, including identifying available resources, the relationship between different resources in the economic unit, the costs of available resources, and how to streamline the management of available resources in the economic unit (Al-Qassas,2020:185).

Thus, it can be said to the researchers that resource consumption accounting aims to achieve the best use of the resources available to the economic unit, which leads to reducing costs to achieve the best added value for the customer to support the competitive position of the economic unit, as it aims to provide basic information about the resources of the economic unit, which includes identifying the available resources, monitoring the use of resources by tracking the amount of materials used and unused, determining idle energy, restrictions and bottlenecks constantly to achieve the optimal use of available resources. By economic unit, this can also be achieved by focusing on the production expenses of each manageable team.

Third:Mechanisms for activating the technique of accounting for the consumption of time-directed resources.

(Aziz,2006:82) points out that the attempt to link accounting with time may be of great importance in an environment witnessing rapid developments, most notably intense competition and working according to customer requirements that require identifying the time used that leads to adding value, and excluding unused time; Time-Oriented Activity (TDABC) and GPK technology have led to the emergence of time-oriented resource consumption accounting (TDRCA) technology. **(**Yilmaz&Ceran 2017:139) pointed out that Time-Driven Resource Consumption Accounting (TDRCA), also known as RCA2, represents an updated and enhanced version of Resource Consumption Accounting (RCA), which is considered the second generation of RCA. TDRCA focuses on activities by changing from multiple cost drivers to a single cost driver (time) as a measure of cost. TDRCA integrates Time-Driven Activity-Based Costing (TDABC) with the German Cost Accounting System (GPK) to overcome the limitations of RCA in addressing fixed costs and converting them into consumed and variable energy through the activities that contribute to generating these outputs. The aim is to create an artificial change in fixed costs by creating a link between resources and output through the creation of a synthetic change. Measuring costs based on a quantitative energy perspective makes it possible to separate idle energy, achieving a more accurate measurement. This technique deals directly with energy and resources to reduce costs by achieving optimal utilization of available resources. (Al-Hibari.2019) states that Time-Driven Resource Consumption Accounting (TDRCA) is a new development of RCA, which integrates the time-driven approach (based on TDABC) into the activity analysis methodology of RCA. This development enhances TDRCA's ability to manage and analyze resources through a dual view of resource consumption. Resources are consumed through a clear causal relationship between inputs and outputs in each resource pool. In the absence of such causality, the time-driven approach creates an indirect relationship between inputs and outputs by directing activities as consumers of fixed resources. Directing time-driven activities as a measure of capacity creates an artificial change in period costs, which are dealt with by root cause analysis as fixed costs. This, in turn, provides more accurate data on consumed resources and consumption drivers, and opens up a wide range of cost reduction opportunities based on consumed productivity using the capacity mechanism, as shown in the following figure :

Figure showing the combination of cost based on time-directed activity (TDRCA) and GPK technology



Source: Nyon, Haider Nehme Kazim, Hatem Karim Kazim, Ali Hilal and Nyon, 2020.

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It can also be said to the researcher that the technique of accounting for the consumption of time-directed resources TDRCA is the latest development in the field of management accounting for control, control of available resources and exploitation of idle energy, as this system is based on the philosophy that the resources owned by the economic unit are the ones that cause time-directed costs and therefore should focus on calculating those resources and what is consumed from it by focusing on the time of their consumption.

Fourth: Comparison between RCA and TDRCA

(Nyon et al.2020: 158) suggest that a range of comparisons between the two technologies can be identified. RCA resource consumption accounting and TDRCA time directed resource consumption accounting and as Follows:-

Table (2) Shows the comparison between TDRCA and RCA

TDRCA	RCA
Resulting from TDABC and GPK integration).	Resulting from input integration (ABC) and GPK
Relies on flexible time guides	Depends on different and inflexible cost vectors
Be less complicated and expensive	Be more complicated and expensive
Measuring the idle energy of resources and activities together	Measure idle energy of resources only

Source: Prepared by the researchers

It can be said to the researchers that the technique of accounting for the consumption of time-directed resources TDRCA represents a new approach capable of allocating costs based on activities, identifying idle resources and determining them according to activity levels based on the volume of outputs and at the level of each resource or group of homogeneous resources.

Fifth: Advantages of applying the technique of accounting for the consumption of time-directed resources (TD-RCA**)** **(**Nyon et al.2020:158) point out that time-oriented resource consumption accounting technology is characterized by:

1. Provide more accurate cost information because the level of detail of this cost information depends on the diversity of final cost objectives such as products or services, especially in light of the intense competition of business organizations, and the cost approach used to provide information affects the accuracy and reliability of cost information and leads to the proposal of waste disposal initiatives and make the product or service at a lower cost.
2. The technique of accounting for the consumption of time-directed resources (TDRCA) (to the theory of constraints (TOC) represented as an administrative approach to specific constraints and the search for ways to solve them by reducing waiting times resulting from constraints by identifying and scheduling scarce resources for activities and removing all bottlenecks of the production process in the economic unit.
3. Time-directed resource consumption accounting technology helps in preparing reports for all administrative levels by providing detailed information at the operational and strategic level that represents real information about the time of completion that this entry provides information on product costs more objectively compared to other cost entrances by excluding idle resources from product costs and working on preparing reports on exploited energy and idle energy. It can also be said to the researcher that the technique of accounting for the consumption of time-directed resources (TDRCA) has many advantages that distinguish it over other cost inputs by excluding idle energy, improving production efficiency, reducing costs, addressing fixed and proportional costs, using flexible cost guides (time guide), and overcoming the complexity that accompanies the application of resource consumption accounting technology (RCA).

Sixth: Requirements for the application of Time-Directed Resource Consumption Accounting (TDRCA) technology

He points out (Wunion et al., 2020: 255) In order to be able to apply the technique of accounting for the consumption of time-directed resources (TD-RCA), some important requirements must be available in order to successfully apply it, and the economic units that apply it help achieve the goals for which it was set, the most important of these requirements are:

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1. Inventory and identification of the resources of the economic unit that are spent, such as salaries, wages, materials, etc.
2. Determine resource cost complexes in homogeneous aggregates such as work cost aggregator and material cost aggregator.
3. Use the available practical energy in determining time-oriented cost rates.

It can be said to the researchers that the technique of accounting for the consumption of time-directed resources faces many challenges to apply. heavily on resources and neglects to address the various causes of bottlenecks and system constraints.

III. PRACTICAL FRAMEWORK

Application of Time-Oriented Resource Consumption Accounting in Lab Research Sample

This part of the research includes an application of the practical steps of the technique of accounting for the consumption of time-directed resources in the Kufa cement plant (research sample).

Thirdly. Steps to apply time-oriented resource consumption accounting technology

This section will shed light on the procedures for applying the consumption accounting technique TDRCA time directed resources to determine the cost of resistant cement in the Kufa cement plant as a research sample and what Its application plays a role in the optimal utilization of resources and thus reduces costs According to the steps below:

Step One: Inventory and identify the resources needed to carry out activities related to a cement product The first step in the process of inventorying the resources necessary to carry out activities related to a cement product is to apply the time-directed resource consumption accounting technique (TDRCA) Inventory and identification of the pools of resources consumed in the production process during the research period for the year (2021), according to the data obtained from the Cost and Pricing Accounts Division in the company for the time limits of the research, which is (2021) and the following table shows the size of the costs spent in the Kufa cement plant as shown Next table:

Table (3) Resources required to carry out activities related to the 2021 resistant cement product

Account Number	Account Name	Amount 100% (ID)	Clinker cost (Ton per)	Cost of grinding clinker (Ton per)	Cost of cement (per ton)
31	Salaries and wages	25,126,998,893	35,753	3,823	39,576
321	Raw materials and raw materials	6,600,763,888	9,914	502	10,416
322	Fuels & Oils	15,720,263,017	23,860	957	24,816
323	Backup tools	5,837,565,747	8,306	888	9,194
324	Packaging Materials	2,793,166,587	0	0	0
325	Miscellaneous	265,749,806	378	40	419
326	Staff Equipment	80,973,137	115	12	128
327	Water & Electricity	5,754,553,320	4,094	4,815	8,909
331	Maintenance Services	619,345,500	881	94	975
333	Advertising, printing and hospitality	24,070,000	34	4	38
334	Transfer, dispatches and contacts	1,259,402,175	1,792	192	1,984
335	Lease of fixed assets	1,229,848,408	1,750	187	1,937
336	Miscellaneous	593,745,791	845	90	935

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	service expenses				
37	Extinctions	4,310,312,092	6,133	656	6,789
38	Transfer expenses	12,409,575	18	2	20
39	Other expenses	137,417	0	0	0
Total Costs		**70,229,305,352**	**93,875**	**12,262**	**106,137**

Source: Authors using Costing Division reports

The previous table (3) shows that the total expenditure of resource costs related to a product of resistant cement and fil during the year 2021 is (70,229,305,352) dinars, and companies always seek to use these resources efficiently to achieve the desired outputs, so focusing on resources and their consumption in the time-directed resource consumption accounting technique (TDRCA) It helps to provide information related to idle energy, which helps senior management to improve the development of its capabilities and control of resources, and thus develop planning and decision-making processes for these resources. In the same vein, Table (4) details the quantities of raw materials and raw materials and the direct costs spent to manufacture the resistant cement product.

Table (4) Direct raw materials and raw materials used in production for the year 2021

Article	Employees	Qty/Ton	Amount/ Thousands of dinars
Wet incoming stone	299	986,100	11,453,250,235
Putty produced (imported)	191	1,126,930	13,965,165,845
Ovens	268	632,506	27,756,009,921
Cement mills	259	657,310	9968188434
Packaging	169	657310	7086690916
Total			70,229,305,352

Source: Authors using Costing Division reports

The company's research sample resources are divided into seven resource complexes, which are as follows:

1. Working resource complex.
2. Complex material supplier.
3. Compound Maintenance Supplier:
4. Fixed Asset Resource Pool.
5. Equipment and tools supplier: includes personnel and miscellaneous equipment
6. Motive power supplier: includes fuel, oil, water and electricity.
7. Service supplies supplier: includes advertising, printing, hospitality, transportation, increases, communications and asset leasing Fixed and miscellaneous service expenses.

Table (5) Resource complexes and their mentors in the Kufa Cement Plant during 2021

Vendor	Resource cost complexes amount/ID	Practical Energy For each complex Resource/min	Average unit cost time / ID per minute
Work Resource	25,126,998,893	42811114	586.927
Material Supplier	15,231,496,222	67762700	224.777
Equipment & Tools Supplier	346,722,943	1362021	254.565
Motive Power Supplier	21,474,816,337	248321187	86.48
Maintenance Supplier	619,345,500	183364036	33.726
Service Supplies Supplier	3,107,066,374	209766835	14.812
Fixed Asset Extinction Resource	4,322,721,667	65790844	65.704
Overhead Resource	137,417	3829.44	35.362

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Total	70,229,305,352		

It is clear from the above table (5) all the resources that were spent in the plant during the year (2021), and these resources are the main and main source of costs in all economic units, whether these units are industrial or service, and they are considered as the main starting point in any cost technology, that the economic units always seek to optimize the use of those resources in an optimal manner for time, In order to reach the desired amount of these outputs on time, so focusing on resources and their consumption according to the time-directed resource consumption accounting technique (TDRCA), helps them to provide information about idle energy, which helps senior management to improve their predictive capabilities, whether in the short term or in the long term.

Step Two: - Identify Homogeneous Resource Pools

In the second step, the resources of the Kufa cement plant (research sample) are grouped in homogeneous complexes, provided that each of these resource complexes consists of homogeneous sources with each other, the time-oriented resource consumption accounting technique (TDRCA) should, above all, determine the cost complexes of resources by grouping homogeneous resources in each complex with similar characteristics in special complexes, Thus, the researcher collected the costs of these resources, which were identified in the first phase in complexes commensurate with the nature of their work in each complex of homogeneous resources, as these complexes will work by distributing costs through the adoption of cost allocations on the amounts of resources consumed by cost objectives, and accordingly the resources consumed in the production process were divided into twelve complexes commensurate with the nature of the resource and the purpose of its consumption .

Third Step: - Separation of costs for resource pools to fixed and proportional In the third step, a distinction is made between fixed costs and proportional costs, as the time-directed resource consumption accounting technique (TDRCA) works by distinguishing between them, that the consumption relationship related to any resource is fixed when the amount of resources (inputs) consumed does not change with the change in the level of outputs of the cost target consumed, and the proportional consumption relationship occurs when the amount of resources (inputs) consumed changes with the level of outputs of the cost target consumed for each resource complex, and it assumes that the resources are consumed In the form of fixed costs or proportional costs, and the fixed cost rate is

Table (6): Fixed and prorated costs in the personnel resource pool

determined on the basis of theoretical energy and proportional cost rate on the basis of practical energy during a certain period, and the time-directed resource consumption accounting technique (TDRCA) depends on quantifying the outputs of resource complexes, such as working hours for the work resource complex, quantities in tons for the material resource complex, maintenance hours for the maintenance resource complex, and others, the use of design or theoretical energy instead of available energy contribute significantly to the stability of fixed cost loading rates on products as they do not change from one period to another as a result of the different conditions experienced by the product in a cement plant, and after studying the nature of the elements and costs and with the help of workers in the cost division in the company surveyed and using (calculation analysis method) the researcher can divide the cost elements in the different resource complexes to fixed and proportional and as follows :

A. Personnel Resource Complex:

Resources	Fixed costs	Proportional costs	Total
Salaries, wages and benefits in kind	22,682,735,493	2,444,263,400	25,126,998,893
Staff Transportation	899,045,791	104,654,384	1,003,700,175
Dispatch of employees	1,329,350		1,329,350
Retirement and Social Security	351775798	32129652	383,905,450
Research & Experiments	0	360000	360,000
Travel & Dispatch	0	27566000	27,566,000
Other Expenses and Charges	503603825	44149766	547,753,591

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Total	24,438,716,907	2,652,896,552	27,091,613,459

Source: Researcher preparation using Cost Division reports

It should be noted that the number of employees in the factory is (1284) employees on the permanent staff and (723) on the temporary staff, according to the statistics of the Planning Department for the year (2021) distributed over the different production stages in the laboratory, so under the time-directed resource consumption accounting technique (TDRCA), The salaries of workers involved in the product manufacturing process are classified as proportional salaries, i.e. directly, as they are directly related to production, while the salaries of employees who are not directly involved in the manufacturing process, which number (821), are fixed salary costs, in addition to the fact that the dispatch and transfer of workers are fixed or proportional costs according to their relationship to the production process and as shown in the table above.

B. Consumables Supplier Complex:

Table (7): Fixed and prorated costs in the consumables resource pool

Resources	Fixed costs	Proportional costs	Total
Raw materials and raw materials	5,913,209,073	6,875,548,145	12,788,757,218
Black Oil	13,096,756,572	1,010,001,646	14,106,758,218
Oils	1,320,943,606	292,561,190	1,613,504,796
Stationery	29,780,520	5,822,662	35,603,182
Supplies & Errands	201,535,690	28,510,932	230,046,622
Packaging Materials	2,590,898,735	202,267,851	2,793,166,586
Staff Equipment	72,094,898	8,878,239	80,973,137
Other materials	2,275,650,169	1,176,508,000	3,452,158,169
Total	25,500,869,263	9,600,098,665	35,100,967,928

Source: Researcher preparation using Cost Division reports

C. Maintenance and Motive Power Resource Complex:

Table (8) Fixed and prorated costs in the maintenance resource complex and motive forces

Resources	Fixed costs	Proportional costs	Total
Building Maintenance	1,785,205,000	226,424,149	2,011,629,149
Maintenance of machinery and equipment	1,342,303,000	43,420,000	1,385,723,000
Transportation Maintenance	158,527,000	6,015,000	164,542,000
Maintenance of furniture and office equipment	148,187,725	16,330,000	164,517,725
Total	3,434,222,725	292,189,149	3,726,411,874

Source: Researcher preparation using Cost Division reports.

It is clear from the above table (8) that the complex of maintenance resource and motive forces costs related to spare tools have been considered as prorated costs because they relate to the maintenance of machinery in the plant, while the costs of maintenance of machinery and equipment and electricity costs are either fixed or proportional.

d. Resource pool of assets used in the production process:

Table (9): Fixed and prorated costs in the pool of the resource of assets used in the production process

Resources	**Fixed costs**	**Proportional costs**	**Total**
Extinction of buildings	0	83,831,813	83,831,813
Extinction of machinery and equipment	0	3,877,449,701	3,877,449,701
Disappearance of means of	0	172,599,078	172,599,078

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Resources	Fixed costs	Proportional costs	Total
transport			
Furniture and office equipment disappear	0	176,431,499	176,431,499
Total		4,310,312,091	4,310,312,091

Source: Researcher preparation using Cost Division reports.

It is clear from the above table (9) that the asset resource complexes used in the production process and the costs of the extinction of assets of all kinds described, which have been classified as fixed costs, and it is clear from the above that there are fixed unexploited costs that directly affect the management decisions of the senior management of the company and related to product pricing due to the cost of idle energy, which has a significant impact on inflating the size of production costs and thus inflating the cost of one unit, Which is reflected in the overpricing of products and thus the loss of market share. After the researcher has identified resource pools and separated fixed costs from proportional costs in them, appropriate resource vectors must be identified for each resource pool from the complexes, on the basis of which fixed and variable cost rates are extracted and can be illustrated through the following table:

Table (10) Cost drivers of resource pools

Resource pools	Causes of costs
Indirect Action Resource Pool	working hours
Indirect Material Resource Pool	Quantity of material (tons)
Dynamics Resources Complex	Machine Operating Hours
Reserve Tools Resource Pool	Number of maintenance hours
Equipment Resource Complex	Number of equipment
Maintenance Services Resources Complex	Number of maintenance hours
Administrative and marketing expenses resources complex	Number of units sold (planned)

Source: Prepared by the author.

It is clear from the above table (10) that in this step the researcher distributed the costs to the appropriate pools of resources, and these costs have been classified in each of these resources as fixed costs and variable costs, as this step is the main pillar in the mechanism of employing time-directed resource consumption accounting technology (TDRCA), and helps in extracting fixed rates of costs through theoretical energy and variable cost rates are extracted through practical energy, Thus, it helps in identifying idle energy by isolating unused fixed costs that do not add value to the main activities in the plant and keeping them in resource pools, as these are considered period costs and these activities are charged to variable costs only as shown in the following steps.

Step Four: Determine the theoretical and practical capacities and fixed and proportional cost ratios After the appropriate complexes for the various resources have been identified and the resource costs are classified into fixed costs and proportional costs, as well as determining the appropriate causes of these resources (quantitative outputs of resources) for each of those complexes such as (working hours for the personnel resource, maintenance hours for the machinery and equipment maintenance resource, and the quantity in (tons) for raw materials, and others), then the theoretical energy and practical energy of the resource complexes are determined as shown in the equations below, Which will be the basis for calculating the different loading rates, whether fixed rates or proportional rates according to the following two equations, provided that fixed costs are linked to theoretical energy, and as for proportional costs, they are related to practical energy :

Proportional cost rate of resource pool = prorated costs of resource pool / practical energy

According to the normal standards by which the production lines of the factory operate by three working meals per day, each meal consists of (8) hours covering (24) hours during the day, and

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the production lines of the laboratory research sample is not covered by holidays or official occasions, as the worker can get certain rest days specified by the production department concerned, taking into account the natural lost time during the day if the worker works (8 hours X Three meals a day for (365) days a month) the theoretical capacity of the 1284 workers (only non-workers in the production process) workers will be 11,247,840 working hours per year.

Daily working hours 24 daily hours
Number of weekly working hours 24 X 7 = 168 hours / week
Number of theoretical working hours per worker per year = 2920 hours / year
The theoretical energy of the plant workers is 1284 x 2920 = 3,749,280 hours

As for the calculation of practical energy, it is calculated on the basis of the actual days during the year (the practical energy is determined on the basis of 80% per day of the theoretical energy in order to take into account the cases of stops for maintenance, repair and other purposes for a period of (365) days per year multiplied by the number of workers 1284 noting that the results of interviews with the laboratory engineers show that the laboratory sample research did not reach this percentage in its work, Therefore, the above ratio is part of the laboratory procedures if the transformation is made to what the laboratory should be, as well as the capabilities available in the laboratory confirm the ability of the laboratory to reach the above energy level if modern techniques are applied to cost management, the most important of which is the techniques posed by this research, provided that the launch of the application of these techniques starts from determining the customer's requirements of the resistant cement product

Theoretical energy = 1284 X 2920 = 3,749,280 hours = 2920 / factor

Practical energy = 3,749,280 X 80% = 2,999,424 h/worker

Table (11) deals with theoretical energy, practical energy, fixed and proportional cost charge rates for resource pools, as shown in the following table:

Table (11) Theoretical and practical energy and resource pool rates for 2021

vendor Work Resource	Theoretical energy	Practical Energy	Fixed cost rate	Proportional cost rate
Salaries, wages and benefits in kind	3749280	2999424	6049.89	814.91093
Staff Transportation	2007	1284	447955	81506.53
Training & Qualification	3749280	0	0.35456	0
Retirement and Social Security	3749280	2999424	93.8249	10.711941
Research & Experiments	16	10	0	36000
Travel & Dispatch	78	42	0	656333.33
Other Expenses and Charges	3749280	2999424	134.32	14.719415
Material Supplier				
Raw materials and raw materials		632,506		10870.329
Black Oil		82748172		12.205728
Oils	250000	175000	5283.77	1671.7782
Stationery	6070	0	4906.18	
Supplies & Errands	13000	0	15502.7	
Packaging Materials	0	32400300		6.2427771
Staff Equipment	4800	3750	15019.8	2367.5304
Other materials	700000	648005	3250.93	1815.5848
Maintenance Supplier				0
Building Maintenance	8760	0	203791	0
Maintenance of machinery and equipment	7700	6800	174325	6385.2941
Transportation Maintenance	700	0	226467	0
Maintenance of furniture and office equipment	600	0	246980	0
Supplier of used assets				
Extinction of buildings	43800	0	1913.97	
Extinction of machinery and	43800	0	88526.2	

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equipment				
Disappearance of means of transport	43800	0	3940.62	
Furniture and office equipment disappear	43800	0	4028.12	

Source: Prepared by the researcher based on the previous table

Step Five: Distribute the costs of activities to the producer and separate idle energy costs In the fifth step, the costs of the activities are distributed to the final products and the idle energy costs are separated in preparation for calculating the cost of the product in the necessary time, and according to the time-directed resource consumption accounting technique (TDRCA), and the resource pools consumed by the activities are determined because the consumption of resources is not directly by the final product unit, but the resources consumed by the activities in the final products, and the activities consumed by the resource pools in the economic unit have been determined as a sample Search as follows:

1. Crushing and grinding activity:
2. Heating and heat activity:
3. Maintenance and maintenance activity:
4. Inspection activity:
5. Activity of motive forces:
6. Transportation and storage activity:
7. Marketing activity:
8. Administrative activity:

Table (12) Activities and their directions for the year 2021

Activity	**Activity Wave**	**Resistant cement**
Crushing and grinding	Number of tons produced	986,100
Heating and heat	Number of tons produced	1,126,930
Maintenance & Maintenance	Maintenance Orders	
Examination	Number of tons examined	632,506
Driving forces	Machine Operating Hours	8760
Transportation and storage	Number of tons stored	657,310
Catalog	Number of tons sold	648,006
Administrative	Number of Employees	100

Source: Prepared by the researcher using the technical department

The table above shows the activities and their directions and from the above activity triggers, the activity load rate will be calculated using the following equation:

Charge rate = Total Activity Cost / Trigger

The following table (13) shows the results of applying the above equation to the activities related to the products of the laboratory of the research sample, in terms of the total cost of the activity and the reason for the activity.

Table (13) Activities and Total Activity Mentor

Activity	Total Activity Wave	Activity Wave
Crushing and grinding	16,662,785,671	
Heating and heat	17,243,356,233	
Maintenance & Maintenance	12,937,939,791	
Examination	9,219,653,519	
Driving forces	7,515,410,504	
Transportation and storage	1,610,120,793	
Catalog	830,474,457	
Administrative	880,915,312	
Total	66,900,656,281	

Source: Prepared by the researcher using the technical department

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Table (13) shows the results of applying the above equation to the activities related to the products of the laboratory of the research sample, in terms of the total cost of the activity and the reason for the activity. As for determining the costs of idle energy, it is done by comparing allocated costs according to Time-Directed Resource Consumption Accounting (TDRCA) technology with Costs realized for the company and for each supplier of Resources of the economic unit research sample as shown in the following table (14).

Table (14) Allocation of costs according to an accounting technique Consumption of time-oriented resources for 2021

Resources	**Realized costs**	**Custom costs According to TDRCA**	**Idle Energy**	**Ratio of idle energy per resource**
Work Resource				
Salaries, wages and benefits in kind	25,126,998,893	22,187,287,111	2,939,711,782	44.67
Staff Transportation	1,003,700,175	1,003,329,699	370,476	0.01
Training & Qualification	1,329,350	649,569	679,781	0.01
Retirement and Social Security	383,905,450	381,772,283	2,133,167	0.03
Research & Experiments	360,000	288,000	72,000	0
Travel & Dispatch	27,566,000	26,253,333	1,312,667	0.02
Other Expenses and Charges	547,753,591	511,509,127	36,244,464	0.55
Material Supplier		-	-	
Raw materials and raw materials	12,788,757,218	12,763,939,997	24,817,221	0.38
Black Oil	14,106,758,218	14,001,318,279	105,439,939	1.6
Oils	1,613,504,796	1,530,221,584	83,283,212	1.27
Stationery	35,603,182	34,588,578	1,014,604	0.02
Supplies & Errands	230,046,622	35,811,342	194,235,280	2.95
Packaging Materials	2,793,166,586	4,045,357	2,789,121,229	42.38
Staff Equipment	80,973,137	38,252,062	42,721,075	0.65
Other materials	3,452,158,169	3,293,233,820	158,924,349	2.41
Maintenance Supplier		-	-	
Building Maintenance	2,011,629,149	2,003,260,862	8,368,287	0.13
Maintenance of machinery and equipment	1,385,723,000	1,325,510,484	60,212,516	0.91
Transportation Maintenance	164,542,000	161,924,007	2,617,993	0.04
Maintenance of furniture and office equipment	164,517,725	162,512,538	2,005,187	0.03
Supplier of used assets		-	-	
Extinction of buildings	83,831,813	83,081,537	750,276	0.01
Extinction of machinery and equipment	3,877,449,701	3,755,283,478	122,166,223	1.86
Disappearance of means of transport	172,599,078	170,069,201	2,529,877	0.04
Furniture and office equipment disappear	176,431,499	174,216,035	2,215,464	0.03
Total	**70,229,305,352**	**63,648,358,282**	**6,580,947,070**	**100**

Source: Prepared by the researcher using the technical department

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It is clear from the above table (14), that the amount of idle energy costs amounted to (6,580,947,070) dinars calculated according to the time-directed resource consumption accounting technique (TDRCA), as the total costs charged to the products are ID (63,648,358,282) instead of JD (70,229,305,352) Because the remaining cost was not consumed by the products and therefore is not charged on these products and this is what distinguishes the resource consumption accounting technology (TDRCA) from the rest of the other technologies.

Step Six: Distribute costs for resource pools on activities The practical capacity of each group of resource pools is determined, as this step includes determining the practical capacity, which is the daily working hours or the time required to complete the production processes related to a cement product at each stage of the production stages that the product passes through, as shown in the table below (15).

Where the time to perform the operation per worker per year = 8 X 24 X60 X 12 = 80% X 110.592

Table (15) Annual Practical Energy for Operations with Relationship to the cement product for 2021

Operation	Employees	Working energy per worker per year per minute 2	Practical energy per operation
	1	2	1X 2 X 80%=3
Initialization and cracking	193	110.592	21,344,256
Rubber conveyor of raw materials into the factory	106	110.592	11,722,752
Grinding of guardian materials	191	110.592	21,123,072
Furnaces for heating and burning materials	268	110.592	29,638,656
Cement grinding	259	110.592	28,643,328
Packaging	169	110.592	18,690,048
Total	1186	663.552	131,162,112

Source: Prepared by the author.

It is clear from the above table (15) that the cost of the unit time is determined for each resource group related to the product operations, this step includes determining the cost of time according to the time-directed resource consumption accounting technique (TDRCA) so each process related to cement production in the sections where the product passes in the laboratory research sample and as shown in Table (16) by dividing the total direct and indirect costs) Operational costs (by the practical capacity represented by the working hours in each process of the cement product In the laboratory research sample.

Table (16) Determine the cost of the unit time per minute for operations related to cement product for the lab Research Sample for 2021

Operation	Operating cost in dinars	Annual Practical Energy Per minute	Unit Time Cost JD/min
	1	2	(1÷2)
Initialization and cracking	9,037,000,000	21,344,256	423.39
Material Rubber Conveyor	2,578,000,000	11,722,752	219.91
Grinding of guardian materials	12,392,000,000	21,123,072	586.66
Ovens for heating	43,883,000,000	29,638,656	1480.6

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Cement grinding	15,165,000,000	28,643,328	529.44
Packaging	6,626,000,000	18,690,048	354.52
Total	89,681,000,000	131,162,112	683.74

Source: Prepared by the researcher.

Based on cost records Lab Research Sample.

It is clear from the above table (16) that the activities related to the product operations and the time of performance of their events have been identified and grouped through the field experience of the researcher and the research of the reality of cement production and interviews with some engineers in the research sample laboratory, and the activities related to the product operations are determined according to the time-directed resource consumption accounting technique (TDRCA).

Table (17) Determine the Total Cost of related operations for cement product in Kufa cement factory

Operation	Operating cost	Cost of materials	Cost of manufacture	costs Administrative and marketing 10%	Total cost
	1	2	1+2=3	4	4+3
Initialization and cracking	3471.82	1.632	3473.45	347.3452	3820.8
Material Rubber Conveyor	21.99	0	21.99	2.199	24.19
Grinding of guardian materials	1583.97	62,455.39	64039.36	6403.9362	70443.3
Ovens for heating	7403	2741.76	10144.76	1014.476	11159.24
Cement grinding	1270.66	812.832	2083.49	208.3492	2291.84
Packaging	592.05	56.928	648.98	64.8978	713.88
Total	11808.22	66,068.54	77876.76	7787.6764	85,664.44

Source: Prepared by the researcher based on the previous table.

It is noted from the table above that the cost is low Total For the raw cement product in a cement factory Kufa

It has become (85664.44 ID / ton) according to the time-directed resource consumption accounting technique (TDRCA), while the reality of the cost applied in the plant reflects that the total cost per ton is (105,860 JOD / ton (the cost of fil cement and the total cost per ton of resistance 113,047)) and this means a reduction in the cost per ton by (20,196) for the fil and (27,383) for the resistor, and therefore it is clear the important role that the application of time-directed resource consumption accounting technique (TDRCA) constitutes in improving the value of the product by improving its quality and reducing Cost Thus, the research hypothesis that the use of time-directed resource consumption accounting (TDRCA) technology would lead to the provision of appropriate information in improving product value.

IV. CONCLUSIONS

1. The failure of traditional cost systems to meet the requirements and objectives of management, as they are no longer able to provide accurate data that help management in making decisions as a result of changes and developments that occur in the business environment, most notably the intense competition that resulted from the emergence of modern technologies in the field of cost management capable of keeping pace with these changes and developments, the most important of which is the time-oriented resource consumption accounting technique (TDRCA).

2. Time-Oriented Resource Consumption Accounting (TDRCA) technology is a time-oriented activity-based cost integration (TDABC) with the German Cost System (GPK) to overcome the disadvantages of Resource Consumption Accounting (RCA)) in addressing fixed costs by converting them into consumed and variable energy through activities that contribute to the generation of these outputs and try to create resources and outputs that combine the resource by creating an artificial change in fixed costs.

3. The technique of accounting for the consumption of time-directed resources (TDRCA) highlights idle energy, excluding idle energy, not charging these costs on products and excluding non-value-adding

activities, it contributes to determining product costs objectively and activating the role of effective control over fixed and proportional cost elements and providing financial and non-financial information for planning and control purposes, Decision-making and continuous improvement in the short and long term, relying on resources and forward-looking activities, as well as providing appropriate cost information based on scientific and objective foundations for the allocation of indirect costs compared to traditional cost methods.

V. RECOMMENDATIONS

1. The researcher recommends, the economic unit should use time-oriented resource consumption accounting technology, as it combines the advantages of (TDABC) technology and (GPK) technology, so the economic unit must provide the necessary information to make long and short-term decisions, that is, make strategic decisions to support competitive advantage.
2. The researcher recommends the need for the economic unit to pay attention to the resources available to it for the purpose of optimal exploitation by determining the energies of each resource and the amount of consumption of the unit of its energies to determine its idle energies.
3. The researcher recommends that the economic unit should search for new ways to distribute indirect costs, as the traditional method of determining the cost of the product does not meet the new requirements because of its weaknesses, or that the accrual percentage is very small compared to other departments.

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