

Cost-Based System of Activities and Extent Correlation with the Theory of Constraints in Industrial Companies to Achieve Profitability and Improve Performance

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Abstract : Most companies aim to be outstanding and strive to achieve profits in the light of available resources. This goal is achieved through the adoption of companies to adopt many systems and theories that ensure this. Companies may sometimes face the scarcity of resources available to them, so companies must adopt with the applicable system theory that help them to improve performance and increase profitability. In some companies, an activity-based costing system is applied, which helps them relate costs to their cause and helps them divide the company's activities into activities that add value and activities that do not add value. Therefore, the use of constraint theory in the use of activity-based costing system will help the management to significantly improve its performance by knowing which activities do not add value and can be addressed through continuous improvement steps within constraint theory.

Key words : Cost-based system of activities, theory of constraints and achieve profitability and improve performance .

Introduction : With increasing global competition and developments in the industrial environment, the need for more innovative systems and theories in improving the performance of companies and upgrading companies to the ranks of international companies has become more difficult. Companies use more than one way to try to break or mitigate these constraints in order to increase the value of a company by increasing profitability either by reducing costs or by resolving bottlenecks encountered and reaching the cost of a product or service more precisely through more accurate measurement methods, one of Innovative ways in which the cost of the product is accurately calculated is a cost system based on the activities supported by the theory of constraints, which are the activities of companies that add value and the other constraint or bottleneck to be addressed. The application of the system with the theory was a qualitative leap for businesses through improved performance.

Search problem: The research problem is how to explain the mechanism of the theory of constraints within a company that uses cost-based activities as a cost system, and to improve the performance of companies in the modern industrial environment that requires a rigorous mechanism of action and extensive studies in order to achieve profitability goals and survival in the global open market since competition has become the key to survival with scarce resources available.

Research importance: The importance of research in the integration of constraints theory and activitybased costing system is of great importance in improving the performance of companies in the modern industrial environment and that this improvement is reflected in the profitability of companies and thus survival, competition and Continuity.

Research Objective: The research aims to address the concept of the theory of constraints and their importance, what the cost-based system of activities is and the introduction of methods of coherence between the two and its role in improving the performance of companies.

Research Hypothesis: The research is based on the hypothesis that the coherence of constraint theory and cost-based system of activities in companies leads to improved performance and improved profitability, and that both concepts can be used side by side without contradiction in achieving the goal.

Research Methodology: The research relies on the inductive method through the descriptive method by relying on the availability of Arab and foreign sources, as well as by conducting a questionnaire for industrial companies, which applies the cost-based system of activities to determine the consistency of the theory of restrictions on the cost system based on activities and their relationship.

First Topic : Concept of the Theory of Constraints arising evolution :

With today's increasing competition and the great industrial progress of the last century, pressure has been placed on departments and companies to optimize their resources to achieve the lowest costs while maintaining quality for market competition. However, some economic resources may be characterized by the relative scarcity of some companies, which means the development of a productive approach that works to increase the utilization of these elements in a way that increases the total of its marginal contributions. This has been addressed using the methods of the most marginal profit per unit of rare resource, is not successful unless there is a relative scarcity of a single resource. If scarcity in more than one resource requires the use of more precise and objective methods, these methods are known as the " constraints theory" which includes the treatment of the optimal production plan in the case of multiple restrictions . (Scarce resources). Restrictions theory is one of the most important concepts used to guide relatively rare elements. The basic idea of the constraints theory is that the company has one or more activities with specific resources or energies that represent restrictions on production processes such as the organization of other activities that do not suffer from suffocation. (Al-Fadl and Noor, 2002: 36). In order to shed light on the nature and importance of the theory of constraints, the following were addressed.

Historical Evolution of Theory of Constraints :The study of the historical development of the theory of constraints dates back to 1980, when Goldratt was interested in scheduling problems. He noted that the requirements planning systems of the prevailing materials assume that there is no problem in the energy available for production in the sense that energy is available 100%. Production capacities make the outputs specific to the type of restriction or suffocation. It has been noticed that increasing production in areas where there is no bottleneck or restriction leads to increasing stocks and not increasing sales but working to break

those bottlenecks to achieve profits in the present and future. Restrictions theory is the third philosophy that complements the most recent and most effective management philosophies in performance improvement: TQM, JIT and TOR. The theory of constraints developed by a facility support tool continuous improvement. In his extensive writing, Goldratt emphasized that he follows the idea and efforts of factory managers and found that they are trying to save their factories from stopping or closing by improving performance by focusing on the bottlenecks, managing them well and studying the development of alternative production paths to relieve the centers of those bottoms. In the end, the goal of the company is to make money and the means to achieve this is to increase the productivity of the factory, and since the profitable productivity is defined by the outputs in the processing of the plant, which represent centers of bottleneck, the focus should be on the management of these centers (Hussein, 2000: 210). On the scheduling of production and control of the flow of resources during production processes through choke management (Al-Fadl and Noor 2000: 36). TOR was defined as a temporary management tool that supports continuous improvement and cost management as an administrative input that seeks to mix a long line of profit from proper management of the circumcision points. The bottleneck of the company or resource restrictions and the key to the idea is to diagnose the restrictions in the system which prevents the realization of the high level of success by loosening those restrictions more and more (earning, 2004: 70). In 1990, the concept of restrictions theory was launched and became important because it leads to the exploitation of resources in order to improve the performance of the company and its ability to overcome these bottlenecks and achieve profits and reduce cost, applied the theory of constraints in solving the problems of bottlenecks and reduce the production of inventory.

Philosophy Theory of Constraints : The philosophy of the constraints theory is to find a solution to the problem of determining the optimum production mix. In the case of relatively scarce resources, which represent bottlenecks limiting the capacity of the whole system and thereby reducing profitability and performance as a whole. These limitations, in the light of the possibilities available without causing any fundamental change in the structure of costs, emerged as a result of criticisms of the marginal profit method used as a means of rationalizing decisions on the optimal short-term productive mix. In articles, the analysis of the margin of contribution is no longer useful for the management of cost strategies. To the effect that the margin of contribution has lost most or all of its relevance to administrative accounting, although it remains useful for a limited number of purposes, according to this view, the margin of contribution ignores the appropriateness of fixed costs, This concept has been passed between fifty and sixty years ago. The theory of constraints helps to identify difficult situations and try to get rid of them. These are situations where products or services reach the stage of partial production and are waiting to satisfy the customer's needs. The bottlenecks can appear at different stages such as the processing stage and Intuitive framework Regular management. The framework ensures the desire for continuous improvement to make the process continuously improving, means it begins with a clear identification of the company's goal and establishes measurements to determine the effect of any action or activity on the target (earning, 2004: 70 71). Goldratt asserts that the goal in the company is to collect profits and does not depend on the traditional system of measuring results, that the theory of restrictions aims to continue to improve the performance of the company as a whole as a prerequisite for success (Hussein, 2000: 209). This philosophy of management believes that production must be top of the list followed by investment and operating expenses at the other site, that the trend to the goal of collecting profits can be a transition from the world of cost to the world of production as there is in the company activity or more with a resource or specific energies that represent restrictions on the processes of production; and therefore must have schedules and organization of operations in order to exploit the activities in which there is a bottleneck as well as the organization of activities that do not suffer from suffocation whereby the goal is to maximize the outputs (Al-Fadl and Noor, 2002: 36) 1996: 1257) in order to increase the contribution of outputs with reduced Investments and

operating costs. In addition, the theory of restrictions is classified as a way to maximize operating profit when there is some rare and other scarce resources. The study of the theory of constraints requires a comparison between what was before the application of this theory and after the application of this theory, where the traditional approach to the division of the big problem to a set of small problems that can be dealt with and resolved followed by regrouping of these solutions and formulation in the solution. One major problem is the critique of this approach that can lead to new problems if there is no consistency between the role of the process concerned and the role of other processes that are affected and influenced by the theory of constraints that the company is seen as a chain interrelated (successive operations) to achieve the goal of the company. Action (A loop within the chain) must perform its required role efficiently and effectively, which determines the performance of the chain that is the constraint within that loop; and the procedure used to increase the strength of the performance of the series of operations is as follows: (Hussein, 2000, 212).

1-Determine the weakest link in the chain (under production process).

2- Not to load the series of production processes with a production capacity greater than the weakest capacity of the process because it is the constraint affecting the production capacity of the chain of operations as a whole.

3-Focus improvement efforts on strengthening the weakest link in the chain.

4 - If the improvement is successful, the strength of the ring will increase (leading to the performance of the series well).

Concept Theory of Constraints: There is no company in the working life, but it is subjected to a set of restrictions that prevent the achievement of its goals absolutely, where the restriction is defined as anything that prevents or prevents getting more than what we want, and perhaps the most obvious restrictions in the working life are the restrictions associated with time and money, and the self-abilities of the individual or the company (Hussein, 2000: 209). The concept of constraints can be defined as an approach towards maximizing profitability by managing focus or addressing the bottlenecks or restrictions (Hilton, 244, 1999), while the softness is defined as an administrative philosophy aimed at continuous improvement of system performance to maximize its outputs and achieve its objectives through some changes in it to activate internal restrictions and deal with them in the light of external restrictions and measure the impact of those changes to ensure optimal utilization of system resources (Al-Tarih, 2006, 12). The performance of any system is defined by a set of restrictions representing a bottleneck point or any other elements of production that reduce total output. The theory of constraints is a philosophy of systems management which believes that these restrictions should be the focus of management efforts rather than reducing costs (Robinson, 1990, 3 :). The theory of constraints can be determined by three measures that are needed as information for the application mechanism: (Horngren and others, 2002: 692).

1-Output contribution: equal to the value of sales minus direct resource costs.

2-Investments (inventory): equal to the cost of inventory (direct resources, production under-production stock and total production stock), research and development costs, and costs of equipment and premises.

3 - Other operating costs: which equals all other operating costs other than direct materials that occur to achieve the contribution of outputs and other operating costs, which include salaries, wages, rent and waste.

From the administrative point of view, Morse said, "for the purpose of applying the theory of constraints on management, the diagnosis of bottlenecks (a resource that is under restriction) is necessary and a production schedule to maximize the efficiency of scarce resources and set production schedule to avoid accumulation of inventory, which reduces the cost of investment that helps improve quality by eliminating quality problems; hence, management must work to address bottlenecks by increasing the capacity of scarce resources and others , 2003, 141).

(L, Huang, 1999 :21) suggests that the theory of constraints assumes that all costs are fixed to increase output and profit, considering that the contribution margin is equal to unit revenue and that it focuses on diverting the administration's attention from cost reduction as priorities to realizing that additional success is more important.

Kinds of Restrictions: Theory of constraints is based on the fact that each company faces two kinds of restrictions, some considered internal and external restrictions, while others considered them as physical and political restrictions such that the types of restrictions can be categorized as follows (Al-Tarih, 2006, 19).

A - Internal Restrictions: It limits the ability of the company to meet the demand for its products and is divided into:

- **Restrictions on energy resources:** This is one of the most important internal restrictions imposed on the process of production of equipment and equipment, individuals and any other tangible resources. This limitation is shown when the output of the restriction is not able to meet the needs of the market and the quantity of stocks of production under operation is a function of this restriction.
- **Restrictions of Administrative Policies:** One of the most difficult restrictions is discovery that has a long-term and invisible impact and arises as a result of the application of some policies in the company such as the need to adhere to a certain rule.

B - External Restrictions: It is a set of determinants that make the company to be late in addressing the needs of customers and divided into:

- **Initial resource restrictions:** This limitation arises in case of short or short supply of primary resources in the short or long term of one or more of the necessary components for the manufacture of a particular product.
- **Demand restriction:** This type is one of the most important external restrictions imposed on the production process and the amount of inventory of full production or operation of a production line with a part of the total output capacity of the restriction being a function of this restriction. Discovery of policy restrictions is more difficult because they are disorganized because they are in rules that show how things should be performed. This is beyond the possibility of creating restrictions. Production cannot take more than the scope of operation through the bottleneck. (Hornagun and others, 1996: 1257) is to increase the contribution of outputs with reduced investments and operating costs and they are classified as ways to maximize operating profit when there are some rare and other scarce resources.

Steps to apply the Theory of Constraints : Decision-making process is applied by applying the theory of constraints to achieve continuous improvement at the company level as a whole by following five steps as follows:

1- Restrictions : This is done by identifying the limitations that limit the possibilities of manufacturing means identifying the weakest rings in the system and notes that there is the possibility of more than a weak link is chosen the weakest loop to take its role in the improvement and so for the remaining weak rings.

2-Determine how to exploit the maximum possible exploitation : that is, the exploitation of the current status in the most efficient and effective possible.

3-The right to all other information the need to exploit the restriction: I make everything to support how to exploit the restriction as in step(B), and is through the adjustment and control of all the activities of other parts of the system, which helps to achieve maximum efficiency and possible productivity of the registration even if required to reduce speed production in resources is not a bottleneck .

4- (C) The only way to improve the performance of the system as a whole and the specific limitation in the manufacturing environment is through increased investments to increase supplier capacity. This step will enable us to break the constraint because there will be no restriction in energy or other as the restriction is permanently excluded and the restriction will be broken.

5 - Refer to step (a) In order to avoid laziness or inactivity: According to the concept of improvement in the theory of restrictions when overcoming the restriction or remove its effect on the system will appear to have another restriction, but does not affect the same strength of the previous record and here should refer to the first step (a) to search on etiology and so on constantly applying steps to implement the theory of restrictions. Figure (1) showed the steps to apply the restriction theory.



Figure 1: Steps applied theory of constraints (earning, 2004. 26).

Second Topic : Activity Based Costing system (ABC) : The cost-based system is one of the most important modern systems, which can produce cost data more accurate than that provided by the traditional system. In this system, companies identify the main activities and have them divided into sub-activities and up to the minute details in order to access accurate data cost, and for the purpose of highlighting what ABC is and what it is.

Historical Evolution of the ABC System: This system was developed by both Cooper and Kaplan through a study applied to General Electric and Robert Kee (Kee, 1995, 27:) confirmed that "He pointed out that ABC has been independently developed by General Electric and other institutions to improve the usefulness of information accounting, where Cooper and Kaplan and others studied organizations that developed innovative accounting systems and introduced ABC to academic literature, noting that ABC differs from traditional cost systems in two important needs:

First : it tracks indirect costs for cost purposes such as products, customers based on factors (cost drivers) that cause indirect costs. The use of many cost factors leads to a more accurate measurement of production costs that reflects the quantity and preference of resources used by products in the manufacturing process and support the stages used in production .

Second: ABC tracks the indirect costs on the structural or tree levels that occurred during the production stages. For example, many indirect costs occurred and were achieved, the product, and the production levels. This enables the construction of a model more accurately to clarify the relationship between the resources used in the productive activities and products used in their production, so it prepares a better estimate of the cost of the product in addition to the individual activities used in production ".

Whatever the idea of cost-based activity is old or modern, the important thing is that the entry into force and use in administrative aspects such as important analysis of profitability and pricing and development processes was only in the late eighties of the last century, where Cooper and Kaplan in a series of articles to make cost ideas on the basis of the ABC activity understandable and applicable, and these articles have generated a wide range of publicity for the application of ABC systems .

"The study of the historical evolution of the system dates back to 1980 when a group of researchers, such as Robert Kaplan of Harvard University and Johnson of Luther University, began raising questions about the appropriateness of actual practice of traditional cost accounting, strongly criticizing the assumptions underlying traditional cost accounting and is not appropriate to the nature of developments in modern manufacturing systems "(Fakhr and Dulaimi, 395). In 1984, Goldert accused the use of administrative accounting in its traditional form to the degradation of the productivity of the company. (Hicks, 1998, 3).

System Philosophy ABC: The essence of the philosophy of the system is based on its ability to transform the indirect relationship of costs into a direct relationship by splitting the process of costing the products as the ultimate cost goal into two stages by adopting multiple cost drivers through activities and thereby achieving the possibility of tracking all cost elements directly on the products considering that the activities are those who consume resources and not products, and some have pointed out that the philosophy of the system of cost-based activity is (Tikriti, 2001, 85):

- A- ABC is the focus of the activities and costs associated with those activities and thus the analysis of activities in any company the cornerstone for the establishment of the ABC.
- B- Based on the above, the activities in the company will be analyzed at the level of the general functions and the main departments as well as the study of the processes and procedures within each department to determine the scope of the activity for the purpose of linking the cost.
- C- Operating a specialized accounting system aimed at satisfying management requests by providing the necessary detailed and more accurate information to create the atmosphere that is compatible with the rapid developments and keep pace with competition.
- D- The essence of the philosophical idea of the system and determine the relationship between the methods of activities and the results of the cost in detail and accurate for the purpose of better management of activities and to make wise decisions.
- E- The purpose of the system is to make continuous improvements in activities, both product and process, and within flexible philosophical principles that can be applied from one company to another in different formats .

Concept of (ABC) system: Prior to entering into the definition of the ABC system, it is necessary to give important concepts to the system and is one of the basics of the application, which is the activities where the activity is defined according to the ABC system (Al-Khalid, 2002, 60, 72) as a process or action resulting in work as a set of processes or procedures that form the core of the work performed within the company and are divided into:

A- Activities that add value: These activities that increase the value of the activity and then add value to the product through the added value to the activity.

- B- Activities that do not add value: The activities that result in canceling the improvement of the company's operations and reduce the costs and these activities are either:
- Unnecessary and can be dispensed with
- Necessary but not efficient and can be improved (hence begins coherence with theory of restrictions).

It should be noted that the number of activities in the company depends on the complexity of the operations, that is, the more complex the operations of the company the greater the number of activities (Garrison and Nurin, 2002, 225). Division of activities according to the above view is related to the concept of the value chain for the purpose of rationalizing cost reduction rather than the ABC concept, which aims at providing accurate processes on the cost of products and defines the value chain "as a coherent set of project functions that create value for the products or services of the organization; It is a set of interrelated activities that create the value of the product from raw resources to delivery of the product or service to the customer (Al Makhlafi, 2002: 45), where ABC coherent the value chain by providing data on the activities and costing them to be analyzed activities and classification activities that add value to the product or service and activities that do not add value and represent these activities (VC value chain). Then comes the role of management on the basis of activities to take action to reduce the cost of activities and work to remove or reduce activities that do not add value and improve the efficiency of activities that add value or replace them by more efficient activities. So the next coupon is more relevant to this end. In addition to its importance in linking the activities of its activities, it is noted that the activities carried out within any industrial establishment are linked to four main levels, through which the cost elements are allocated and distributed to the products (Al-Khalid, 2002: 81):

1-Activities at the level of the unit of the product: These activities are carried out with the production of each unit and thus the number of times that this activity is different can be identified; and therefore the difference of the number of units produced can be loaded as costs of these activities on the units produced, and product formulation achieved.

2-Activities at the level of production batches: These activities are carried out when producing each set of products and thus the number of times that the activities are related to payments varies according to the number of payments produced and the costs of these activities can be loaded on the payments produced, but these costs are fixed for the number of units that each form consists of, prepare the machines whenever the production of each batch of products is completed and request a batch of spare parts.

3-Activities at the level of production: The activities required for the production of each type of different products of the company and are carried out to service the different products of the facility and thus can be charged the cost of these activities on different products, but these costs are fixed for the number of units of each product or each batch production; Examples include product specification, implementation of engineering change orders, and development of test methods for the product.

4 - Activities at the level of facilities (the possibility of production): These are grouped in a way, for example, where possible in the center of one activity because they are related to the production in a comprehensive and not related to parts or other characteristics of the products that are manufactured and examples of lighting supervision cleaning. ABC system is a "comprehensive framework that first tries to identify activities that consume resources and then trace the source of the costs associated with that. The allocation of the costs of the activity to the products by determining the cost leader for each activity by calculating the average cost of that router and using it as the basis for loading the cost of the activity on the unit of the product. (Sheikh, 2001, 162), and al-Daqaf believes that philosophy the system is based on two important pillars according to the following: (Daqaf, 2004, 96):

1. Focus on activities. 2. Comprehensive costing.

Al-Mu'aini believes that ABC is an input and output system. In the input aspect, ABC concentrates on resources without costs and processing is done at smaller cost centers (activities). The output is to allocate these costs to the cost targets using other cost guides (Meini, 2000, 55).

ABC system is applicable to all large, medium and small companies so we see that the company applied if you mentioned that it uses the ABC system and wrote it in capital letters. This is a proof that the company is large if you say that it applies ABC in lower case or small size (Hicks, 1998, 5).

There are five basic steps to implement the ABC system that can be identified as follows (Al-Tikriti , 1996, 6_7):

A-**Planning:** The planning stage is one of the important stages in determining the success of the design of ABC in any company. The importance of this stage is concentrated in preparing an appropriate team for the design and implementation of the system. At this stage the problems facing the company are identified, the type and level of information required for decisions to solve these problems and to develop them in a way that suits the new system.

B - **Identify and compile the main activities:** This stage is the actual beginning of the application or design of the ABC system where the company is studying and identify the nature of work in each section within the process of production.

C- **Registration of the cost of activities:** After the completion of the identification of activities and the appointment of its activities, the costs of these activities are recorded for each activity, since the cost of the activity is equal to the total cost of the activities that comprise this activity and to determine the cost of the activities. The information available in the accounting records, the accuracy of the analysis of activities depends on the management decisions and the level of information required in order to obtain the highest possible benefit with the lowest total costs necessary to operate and maintain the system. In general, ABC is based on the identification and analysis of activities from the beginning of the request materials through productivity and ending with product development activities in the market.

D) **Determination of Activity Centers:** Activity centers are the division of production operations through which the administration wishes to record the costs of the completed activities in detail. For example, the receiving department may act as a receiving center. The ability to record costs through the activity center gives managers the ability to Better control of activities.

E) choice of cost guides is defined as a cost characteristic : (Hilton, 1999: 36:) as "a characteristic of activity or activity that causes costs during the event of such activity or activity". The choice of cost guides is a set of criteria that must be taken into account including the causal relationship, the benefits received, cost/benefit, relative importance, and behavioral effects. (Hassan, 2002: 89).

F) Costing products: After the activities have been grouped into the cost groups and the appropriate cost guidelines are determined, the cost of the unit is calculated.



Figure (2) shows the steps to implement the ABC system .

Third Topic: Coherence the theory of constraints and the Cost system based on activities in improving profitability by rationalizing the cost and choosing the optimal production mix.

With the increasing competition at the present time and the great technological progress, pressure has increased on the departments within the companies in order to optimize their resources to achieve the best performance at the lowest cost and raise the quality level required. Through the study of the historical evolution of the system and the theory we see that there is a correlation of evolution and that one of the authors of the theory of limitations of the world of Goldert has been the founder of the ABC system which indicates the convergence of theory and order. The use of coherence between the theory of restrictions and the ABC system helps these companies to optimize the use of resources because some of these resources are rare, which means using the theory of restrictions at the core of the work of ABC by dividing the activities into a host of value and this is not considered in the process of production and activities do not add value to the process of production and work to improve it through the steps of registration as done previously.

Baxendale (Baxendale, 2004:3232) noted that "ABC can be used to improve information arising from managerial accounting, which comes from the system of output accounting based on the theory of constraints, as the information provided on both the theory of restrictions and the cost-based system of activities supports the decision-making process. At the beginning of the ABC, there was a tendency to ignore the idea of isolating unutilized energy costs, but in 1992 Cooper and Kaplan pointed out in one article how to address the costs of unexploited energy at the level of activity.

Robert Kee stressed the importance of complementarity between the two concepts (Kee, 1995,48). He noted that "both the theory of restrictions and the activity-based cost system represent alternative schemes for the model structure of an enterprise's production structure, both designed to support managers in understanding processes within the organization and for the processing of information for resource allocation decisions. While their objectives are similar, the means used to accomplish these purposes vary significantly. ABC represents an expansion of traditional cost systems. The companies that applied it have recognized that they have developed an understanding of the profitability of their production lines and customers. Pal on the contrary, the theory of restrictions is a theory for choosing the optimal production mix and providing an inhouse look at manufacturing processes that are ignored by traditional cost systems. Companies that have applied the theory of restrictions have indicated that they may helped reduce routing time, turnaround time, inventory, as it improved productivity and quality".

The basis of the constraints theory is the use of the cloud-based production management system, which is defined by moving products into production only as energy that is available for the complete purpose. The production capacity within the drag system is controlled by energy by the industrial process towards restriction and output; The main purpose of the constraints theory is to emphasize the need to transform the management style of the company and to shift from the priorities of reducing costs to realizing that the success of overcoming obstacles is more (Massi, 2002, 21: 2002). The shift requires that the circuit focus on outputs that are related to focus on restrictions as well as production capacity management on continuous improvement rather than on cost.

ABC assumes that all costs are traceable to products and vary in proportion according to the cost factors either from the point of view of the theoretical restrictions. The costs are fixed and submerged in relation to product choices and production level decisions. Thus, information about the cost saved from ABC is used in the theory of constraints for productive choice decisions. In order to gain a coherence understanding of the process of linking ABC and constraints theory; Hank first defined ABC and the theory of constraints through various theories and analyzes different for cost accounting like Robin Cooper, Thomas Johnson, Robert Carpn, Horngern, Sndm, Simson (Massi, 2002, 23).

Application of the ABC system in companies achieves the following advantages (Al-Fakhl and Dulaimi, 2002, 436):

1-Improve planning and control functions.

2-Improve administrative performance and raise efficiency.

3-Adjust spending and measure the cost of products properly.

4-Drawing a scientific and sound pricing policy.

5- Accuracy in allocating resources to actual needs.

Application of the theory of constraints achieves the following effects (Al-Tarih, 2006, 41):

- 1. **The impact on planning:** As we live in a world characterized by scarce resources, the allocation of these resources to activities is always the preoccupation of the administration (and there is the role of the theory of constraints in exploiting available resources).
- 2. Effect on control: The control function as one of the administrative functions of the company reflects the vitality and ability of the company to continue as effective control to achieve the objectives of the company (here the role of the theory of constraints in correcting deviations).
- 3. Effect in decision making: The decision is defined as the choice of the best alternatives available after studying the expected results of each alternative and its impact in achieving the objectives required, and highlights the role of the theory of constraints in the field of decision-making by identifying the restriction and try to exploit it and support all other activities of the activity of registration. Rest of the costs of direct wages, indirect manufacturing costs, and administrative and marketing expenses are fixed costs, linking ABC to the theory of constraints comes from a natural point of view. The cost of the product is calculated according to ABC, it is assumed that all costs are traceable to products and vary in proportion according to the cost factors, either from the point of view of bottlenecks, the costs are fixed and sunken in relation to product choices and production level decisions. ABC placed in the theory of activities) and in order to gain a full understanding of the process of linkage between the ABC system and the theory of constraints and to enable the company to improve its performance continuously by the application of ABC system supported by the theory of constraints.

Benefits of coherence between ABC and TOC: The basic benefit of the coherence process is to improve the overall performance of the company by improving profitability as well as overcoming the restrictions that limit the overall capacity of the company. Baxendale (2004) notes that ABC uses the information used in the theory of constraints and adds cash value. It can be divided into cost factors (hours of operation) and the result is a loading rate multiplied by the number of minutes required to produce the product from that activity. This will give us the estimated cost of the activity to produce one unit. The activities that do not have idle or energy-deficient energy are classified as bottlenecks. ABC differs from the theory of constraints in that it tracks resource costs on activities and then divides the cost of the activity (required by ABC) into the activity energy (required by TOC and ABC) to arrive at an activity load rate (required by ABC). The loading rate is then multiplied by the amount of the cost factor required for each product of each activity (required by TOC and ABC). Based on the number of planned units produced from the product, for each activity with planned energy costs of the activity to arrive at unutilized energy costs Method for each activity (expressed in financial amounts by ABC and non-financial figures by the TOC), ABC approach is produced with information provided by the theory of restrictions with regard to energy idle activity. As a result of tracking operating expenses on products and on idle energy, ABC income statement provides additional information on the profitability of one unit per product, which cannot meet the income statement according to the theory of constraints on availability. However, there is a risk of misuse of the information provided by ABC income statement, the basis of the cancellation of the product that achieves a loss according to the list.

Therefore, an appropriate decision-making input should be used with a focus on the output of each product. If a product's output is positive, it should not be cancelled given that the fixed operating banks related to the product will remain even after its products' cancellation and add them to the idle power cost for each activity was associated with the output of that product.

Comparison between ABC System and Theory of Constraints :

For the purpose of comparing the two concepts, the similarities and differences between them must be considered in order to arrive at the coherence mechanism. The constraints theory deals with the cost elements differently. The theory of constraints (Kee, 1995: 29) treats the cost of direct materials as variable cost while direct labor and all other costs are considered fixed for the purpose of reaching the margin of contribution in order to maximize profitability, it is similar to the theory of direct costs in the process of determining profit, "while the system of costs based on activities see the costs as direct and indirect in light of their ability to trace the products and the activities as a means of converting what is indirect to direct and thus the margin of contribution measured by this system is different from the margin of contribution measured by the theory of constraints. Baxendel pointed out that the fundamental difference between the theory of constraints and the activity-based cost system in the second is to adopt cost tracking to obtain the cost of production while the theory of constraints hinders the attempts to determine the cost of production. However, both concern the idle energy of the activity sufficient to support decisions in the short term. When the constraint is external, the theory of restrictions is insufficient to support marketing decisions. For example, in order to make a strategic decision related to the development and enhancement of the product, in order to increase, the theory of constraints and cost-based information must be linked to activities (Baxendale, 2004, 33).

Methods of coherence of the theory of constraints with the system of costs based on activities:

There are many authors who have addressed the relationship between the profitability of the establishment and improve its performance and each proposed a method for this improvement, including the use of both concepts, although each of them linked to decisions in different time range. However, the two concepts can be coherent into the formulation of a model to rationalize the optimal production mix decisions and thus increase profitability in the short and long term; Robert Kee noted that a model of integration can be formulated by coherence programming through a software program after processing data from the data, and to coherent ABC with material use and with the production capacity of the activities. The activities at the level of duties and products are represented as variables. The model is fully calculated using the link between cost, material resources and the energy of productive activities. Therefore, it is possible to apply many of the principles of TOC, ABC in a general working formula, and the solution to the programming model for the coherence of the mixture gives the optimal production mix to the individual production capacity of the activities appropriate to the production structure of the organization and identifies activities that do not represent excess bottlenecks and resources; these are resources that may lead to the model that provides the starting point for applying the principles of collards to manage and regulate production bottlenecks. Using sensitivity analysis of this model, the expected increase in production and profit can be estimated. By solving the problem of activity that constitutes a limitation and identifying the activity that will be the new restriction when the first constraint problem is solved (Kee, 1999: 30).

Hank discussed three types of coherence between the two concepts (L,Huang, 1999, 23) Agencies:

1-In terms of short-term decision support by TOC and long-term decisions by ABC:

TOC is useful in the short term where the costs are fixed (on the basis that all costs are variable over the long term) which means that the improvement of profitability is achieved by increasing the output for this performance and is measured against the efficiency rather than the efficiency being a representative of the pillar in cost accounting. In the short term, decisions require management to accurately measure the impact of alternatives to change inputs, while ABC is initially used as a way to improve long-term decisions by improving product and mix selection, size facilities, and location where all costs are variable. The economic

principle in the short term versus the long term depends on the expansion or linking of energy within the production facilities where both concepts are best applied in the long term and are not suitable for the medium range in which the costs are a mixture of fixed and variable. Direct for the purpose of measuring continuous cost plus financial reporting along with ABC.

2- Sample coherence programming : Hank noted that this model represented the preference in linking the objective function with the restrictions with continuous and complementary variables. The objective function is used to describe the objective of the organization, while a second equation is used to construct a model of restrictions limiting the objectives. Function to maximize soft variables that measure the excess resources of resources and activities that do not constitute a restriction, the value of the objective function is maximized.

3-Time, Cycle, ABC, and TOC: The organization of a combination of time cycle, ABC and TOR, and the classification of activities in six groups of the time cycle are: preparation, waiting, operation, inspection, unloading, and stirring that represent a distinct method of coherence between the two concepts. Break down of the time cycle into small periods that become manageable for stages and organization of stages associated with products, customer orders, or meals. Time cycle management through ABC and TOC can be accomplished through multiple processes, such as increased productivity and cost-benefit analysis. The theory of constraints helps to increase productivity by reducing the cycle of time without the addition of energy and enables the scheduling of time delivery, increasing the output in the enterprise that has internal manufacturing, and reducing the average fixed costs per unit in the short term.

ABC facilitates cost-benefit analysis in quality decision making, taking into consideration the activities of the time cycle by answering five questions:

1-Does the excessive reduction of the cycle of time increase the output?

2-What activities consume the most of resources within each stage?

3-What activities can be changed or reduced without the second on outputs?

4-What will cost us as a result of changing or reducing activities that contribute to the cycle of time?

5-What are the reasonable cost savings resulting from reducing the time cycle of a particular activity?

Coherence of ABC and TOC can answer these questions and this coherence will provide a database that supports the process of making and improving decisions.

Steps to Implement coherence ABC system supported by TOC:

ABC system, which is supported by the theory of constraints, can be applied according to the researchers' view by linking the concept of classification of activities according to the value chain. The function of any organization is defined in the classification of activities by the activity-based cost system to diagnose activities that do not add value first, and the translation of this in a cash format that shows the cost of the unused energy for each activity that is not yet tied to the activity classification according to the concept of the constraints theory on the grounds that it represents a restriction first and then to utilize the information provided by ABC on the cost of the activities directly. The margin of contribution of the products first and then the element of relative scarcity (a resource that represents a restriction) is achieved through the following steps:

Phase 1: Planning and assembling of activities and determining the costs supported by the theory of restrictions, also called the stage of diagnosis and classification of restrictions in the system: At this stage is identification problems of the company (bottlenecks), type of bottlenecks and what are the scarce resources (restrictions on the company). These activities, which make the processes in the form of a series and then loops and then classified as follows:

- A- Activities or rings add value and are exploited optimally.
- B- Activities or workshops are inefficient and can improve any restricted activities.

Phase 2: Exploitation of restrictions or activities optimal exploitation: This stage is through the support and modification of all activities to help achieve the maximum efficiency and possible productivity of the registration (without increasing its capacity in a way that leads to increased costs) even if the commander orders to reduce the speed of production in activities that do not suffer from suffocation.

Phase 3 : Raising the restriction and determining the cost guides: After raising the restriction, the cost guides are determined more precisely and the appropriate criterion is chosen. The cost is strictly linked to the cause. The second stage is considered as support.

Phase 4: Determine the cost of the products and the amount of contribution to the profits:

At this stage, the costs are determined more precisely through ABC after removing the restrictions and excluding the activities that do not add value. Through this stage, the contribution of the outputs of the products is determined to achieve profitability on the basis of the contribution of each product and then the marginalization of the product contribution, selecting the best productive mix accordingly to maximize the profitability of the establishment.

Phase 5: Continuous improvement and return to the beginning of the system:

The constraints theory assumes that after removing the weakest loop (activity that adds value), there are other activities that are less vulnerable than the first. You need to repeat the previous steps and thus through continuous improvement.

(Applied side)

Analysis and interpretation of questionnaire results:

For the purpose of achieving the research objectives, the researchers distributed questionnaires on the research sample in three Iraqi factories (Al-Dawh Cement factory in Samawah and the textile factory in Diwaniyah and the rubber factory in Diwaniyah), where 60 forms were distributed: 20 forms per factory and two axis. The first relates to the efficiency of applying the cost system based on the activities in the industrial companies. The second axis relates to the extent of the correlation between the cost system based on activities and the theory of constraints in improving performance and increasing profitability. All forms were retrieved and analyzed according to the Likert five scale Data in the statistical program SPSS for answers to the questionnaire and as shown in Table 1 below:

Table (1) The five - Likert scale						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree		
1	2	3	4	5		

1) General Information:

Table (2) and (3) summarizes the results of the responses in the research sample collected by the questionnaire forms and showed the following results:



Analysis and interpretation of the results of the questionnaire:

In the analysis of the results, the researchers used the SPSS program to calculate the mean, standard deviation and relative weight as shown in Table (4) and (5) as follows:

The first axis: the cost system based on the activities and the extent to achieve the profitability of companies.

Table	number	(4)
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Seq.	Questions	mean	Std. deviation	Ratio	answer
1	The company applies cost system based on activities, it divides the center into several activities in one section	4.03	0.581	71%	agree
2	Cost-Based Activity System Progress in the production process is better than traditional systems by dividing the activities of the centers within the company	4.02	0.725	58%	agree
3	The information provided by the cost-based system is more accurate than other traditional systems because of the division of activities within the company's production and service divisions.	3.95	0.622	76%	agree
4	The cost-based system of activities divides activities into activities of value and value that have no value in the production process for the purpose of disposing of activities that do not serve the production process in achieving the highest profitability	3.77	0.963	58%	agree
5	The ability of the cost system on the basis of activities to shift the relationship between costs from indirect to direct relationship related to products and exploitation of all resources within the industrial company.	3.90	0.775	68%	agree

In the table, we note that the respondents agree on the possibility of applying the cost system based on the activities. The answers agreed that the system provides more accurate information than traditional systems. (The company applies cost system based on activities, it divides the center into several activities in one section) within the productive and service sectors of companies at the highest mean (4.03) and standard

deviation (0.581). (The cost-based system of activities divides activities into activities of value and value that have no value in the production process for the purpose of disposing of activities that do not serve the production process in achieving the highest profitability). The result shows mean (3.77) and std. deviation (0.963). This is evidence of the possibility of applying this system and achieving profitability for companies.





The second axis: profitability and performance improvement through the correlation between the cost system based on activities and the theory of constraints .

Seq.	questions	mean	Std.deviation	Ratio	answer
1	There is a correlation between the cost system based on activities and the theory of constraints to achieve profitability and improve performance by overcoming obstacles and removing bottlenecks within the company's divisions.	3.57	0.909	60%	agree
2	There is no relationship between the cost system based on activities and the theory of constraints to achieve profitability and improve performance within corporate divisions.	2.87	1.049	28%	agree
3	The restriction theory helps to exclude inefficient activities, remove bottlenecks and restrictions within departments and centers, and develop the production process.	3.92	0.671	70%	agree
4	The inability of the theory of constraints to help management make decisions that improve performance in the short term because of the internal and external constraints facing the company.	3.10	0.775	30%	agree
5	The theory of constraints helps to increase output from production by using special accounting concepts that are handled precisely by linking the theory of constraints and the cost-based system of activities.	3.98	0.537	81%	agree

Table number (5)

In the table, we note that the respondents agree to question no. (5) (The theory of constraints helps to increase output from production by using special accounting concepts that are handled precisely by linking the theory of constraints and the cost-based system of activities.), where the mean is (3.98) and the standard deviation (0.537). Results of question No. (2) (There is no relationship between the cost

system based on activities and the theory of constraints to achieve profitability and improve performance within corporate divisions) shows the mean (2.87) and standard deviation (1.049). This is evidence of the absence of constraints and restrictions on the application of the cost system based on activities and profitability.



The theory of constraints helps to increase output from production by using special accounting concepts that are handled precisely by linking the theory of constraints and the cost-based system of activities.



CONCLUSIONS:

- 1. Theory of constraints is a method of studying the scheduling and organization of production in a way that works to solve the problems of production processes through a series of steps from the diagnosis of problems in the whole system to the solution of these problems and represent the point of view management theory of constraints.
- 2. Restriction represents any problem that limits the ability of the whole system, which may be a stage or any economic resource in the production resources. The constraints restricts the capacity of the whole system under the card of that limitation. The restrictions theory views the activities as a series of operations, the chain affects the string tightening.
- 3. Restrictions are mainly those of production, where resources are classified as resource restrictions (100% exploited) and resources that do not constitute a bottleneck (containing unutilized energy). This classification is the first step in the application of the restrictions theory, which is called the diagnosis stage.
- 4. Classification of restrictions in relation to the company to internal restrictions and external restrictions. This classification helps to identify restriction that can be controlled and solved by the theory of restrictions on the mind that the task of internal theory is related to solving the internal bottlenecks that the company has control over external resources to resort to other methods to solve them.
- 5. Objective of the theory of constraints is to increase output from production in order to improve the performance of the enterprise and increase profitability. This objective is achieved by using accounting concepts as the theory of constraints is an advanced method of measuring costs according to the direct theory of the contribution margin. In light of this, decisions are made to choose the optimal production mix that maximizes profits. This view represents the accounting view of the theory of constraints as a tool that supports the rationalization of decisions in the short term.
- 6. Criticism of the restrictions of the inability to support decisions aimed at improving the performance of companies in the short and long term together so it is integrated with the system of costs based on activities so that the information resulting from both concepts in the provision of information to support strategic decisions to improve performance on the concept that ABC provides accurate information on the cost of products by diagnosing and classifying productive activities in a way that converts the cost-tracking method into activities and then into products and thus identifies the activities related to each product. When linked to the value chain concept, classify the activities to activities add value and not add value and thus supporting decisions to reduce costs for the company and other strategic decisions in the long term.
- 7. There are different approaches to the coherence of the two concepts according to the purpose of the coherent process, which is to rationalize the decisions of the selection of the optimal mix, the most important method of programming coherent of the mix through the use of a computer program to work to give distinct results after the introduction of data from data that relate to both concepts.

Recommendations:

1. Increasing the studies related to modern concepts of rationalization of decisions, especially the theory of restrictions and concepts can be coherent with them and the introduction of more treatments that increase the profitability of the establishment and benefit from the services that can be provided by the computer in this area.

2. For the purpose of coherence of the two inputs, it is necessary to link the value chain concept to activities and to divide the company's activities into:

- Activities that add value and work to exploit them optimally.
- Activities that represent a constraint or suffocation that needs to be treated.

3. For the purpose of addressing the bottlenecks in a company, the cost system should be used on the basis of activities supported by the theory of restrictions through steps to begin to diagnose the restrictions within the system and then exploit the restrictions or activities to optimize exploitation and then raise the limitation and determine the cost guides and then determine the cost of products to the last step as a continuous improvement of the system.

4. For the purpose of rationalizing decisions in the long and short term must expand the perceptions of customers with information systems accounting, administrative and cost of the need to link administrative and accounting concepts in order to serve the objectives of the enterprise as a whole because the main objective is the continuation of the company and its survival.

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