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Adopting a Culture of Total Quality Management in Measuring Green Costs and its Reflection in Improving the Indicators of Continuity and Growth a Survey of Some Industrial Companies in Sudan

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Abstract *Adopting the knowledge of total quality management, which is one of the vital factors in improving the quality of products and services by adopting continuous methodologies for development and improvement when integrating this knowledge with green costs, which focus on measuring the cost of the product while taking into account the environmental impacts, and the importance of the study lies in the fact that the phenomenon of environmental pollution and global warming has become a topic of global interest from the political, economic and financial aspects, and most industrial companies in Sudan do not care enough about measuring green costs. This study aims to provide a scientific theoretical framework by identifying the criteria and rules for determining and measuring green costs and obtaining practical results from the study for the possibility of applying them in Sudanese industrial companies. One of the most important results reached by the study is that adopting the culture of total quality management in measuring green costs improves the indicators of growth and continuity in industrial companies in Sudan.*

Keywords: *Total Quality Management, Green Costs, Continuity, Growth*

1. INTRODUCTION

The phenomenon of environmental pollution and global warming is considered one of the emerging phenomena that are related to human behavior towards nature, including pollution of greenhouse gases and ocean and river waters because of industrial and technological waste and other practices that lead in their entirety to the disappearance of what is known as the sustainable environment or the environment friendly to humans or the green environment. These practices that cause damage to the sustainable environment lead to increased production costs or costs of addressing environmental issues, which requires industrial establishments and companies to measure these indirect costs as costs that have an impact on their profits and thus on their growth and continuity.

In light of the industrial changes and developments, companies constantly need to adopt new and appropriate standards to measure environmental costs or rely on some standards that have proven their effectiveness in measuring the efficiency of such costs that are difficult to measure and determine. It has been proven that the Total Quality Management approach is one of the most effective administrative approaches that can be adopted in such cases to be able to deal with green costs, determine them, and know the reflection of this in improving the indicators of growth and continuity.

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2. STUDY PROBLEM

Most industrial companies in Sudan suffer from problems related to growth and continuity for various reasons related to their financial performance, but many researchers have indicated that among these reasons is the failure to adopt a comprehensive administrative culture that cares about measuring green costs that occur as a result of industrial pollution from gaseous waste and solid materials that harm the green environment and humans and cause an increase in the temperature of greenhouse gases. We can formulate the problem by asking this basic question:

Is it possible to improve the opportunities for industrial establishments to grow and continue if a culture of comprehensive quality is adopted in measuring green costs?

Importance of the study

This study has scientific and practical importance considering that the phenomenon of environmental pollution and global warming has become a topic of global interest from the political, economic and financial aspects. Also, most industrial companies in Sudan do not care enough to measure green costs.

Study Objectives:

This research aims to accomplish the following:

1. Provide a theoretical explanation of the scientific principles behind green costs and identify the rules and principles that are used to calculate and measure these costs.
2. Get practical results from the research for a possible use in Sudanese companies.

The hypotheses of the study are as follows:

The investigation is predicated on a primary hypothesized fact:

A significant correlation exists between embracing the culture of total quality management regarding green costs and improving the metrics of growth and consistency in industrial companies in Sudan.

Study structure:

This research is composed of a introduction that describes the methodology of the study along with previous studies and four primary axes: the first axis is total quality, the second axis is green costs, the third axis is continuity, the fourth axis is growth, and the fifth axis is field research, all of which are followed by a conclusion that describes the results of the study, recommendations, and references.

Keywords:

Total quality: continuous improvement.

Green costs: environmental costs.

Green dimension: environmental dimension.

Growth and continuity indicators: an indicator of competitiveness.

Previous studies:

Study: (Gamble et al: 1996 AD) This investigation intended to assess whether or not the disclosure of environmental costs (green costs) by companies that are said to have a negative environmental impact and that are listed on the American stock exchange is sufficient and appropriate for investors in the securities of these companies. The environmental disclosure was scrutinized and assessed for a sample of these companies, which included twelve different industries from the time period (1986-1991 AD). Among the most significant findings was that companies involved in certain industries like petroleum refining, chemicals and waste had a large amount of information about their efforts to combat pollution, this information was most likely released in the last 3 years, and the information was of a higher quality when the company was listed on the NYSE. Ultimately, the investor who chooses which stocks to purchase is dependent on the information regarding the environmental performance of companies involved in combating and preventing environmental pollution. The previous study discussed the green costs of companies that negatively impacted the environment, such as oil companies, while the current study focuses on the culture of total quality and its utilization in the measurement of green costs and their impact on the expansion and sustainability of public-based industries.

Study: Hatem Mohammed Mutawwa (2010):

This investigation intended to determine the effects of various components of the total quality management system as independent variables on the Palestinian plastic industry's competitiveness as a dependent variable, as well as to identify the most significant quality issues and problems associated with plastic products in Palestine. The investigation assumed that there is a significant relationship between satisfying customer needs and becoming competitive for Palestinian plastic factories, that there is a significant relationship between the commitment of top management to quality for plastic factories and becoming competitive for Palestinian plastic factories, and that there is a significant relationship between improving the product and becoming competitive for Palestinian plastic factories. The study's findings indicate that there is a significant relationship between fulfilling customer needs and the senior management's commitment to the total quality of the product of administrative systems, operational procedures and marketing policies, as well as the variable of total quality management and competitiveness in the Palestinian plastic industry. There were no significant differences at the significance level (0.05) between the different aspects of quality management

system Comprehensive (derived from the fulfilling of customer needs and the efficiency of administrative systems and operational procedures, as well as marketing policies and competitiveness in the plastic industry). The investigation recommended improving the management's trust in the workers and allowing them to participate in developing strategies and implementing initiatives, and comparing the quality of their products to that of their competitors in the market. This would serve as a supplement to the other departments' functions. Palestinian factories that produce plastic must also have a defined system for maintaining machines and equipment and having specific corrective procedures like implementing a periodic inspection method to assess and improve the quality of their production.

The previous study discussed how to become more competitive through total quality management, while the current study focuses on the culture of total quality and its application to measure the green costs of businesses and their impact on the growth and longevity of industrial enterprises.

Study: (Al-Tayeb Muhammad Ali, 2007 AD):

The investigation attempted to attempt to present proposals that would address some of the flaws that prevent the basic requirements of international standards ISO 9001-2000 from being applied in full, then documenting and identifying the technical, intellectual, and philosophical aspects of quality approaches. The investigation's findings were derived from these analyses, which revealed that Ras Al-Anouf Oil and Gas Company employs the ISO standards in a variety of proportions, this company employs the following standards in part (quality management system requirements): 62% of the responsibility is held by the management, 85% of the achievement is achieved by the product, and 72% of the improvement is measured, analyzed, and improved by the company. Regarding the resource management requirement, it is implemented entirely for the company examined.

The previous study conceived of a quality system that met the requirements of international standards, while the current study concentrates on the culture of comprehensive quality and its application to the measurement of green costs and their impact on the growth and sustainability of industrial facilities.

Study: (Mohamed Ibrahim Yousef Al-Zain, 2006 AD):

The problem of this study was formulated in several questions, which are as follows: To what extent is total quality management applied? What is its impact on enhancing and improving the overall performance of Sudanese organizations dedicated to construction? What

is the appropriate model of improvement that Sudanese building organizations can utilize as a component to augment their overall productivity? How can the model be utilized scientifically? This investigation intended to know the degree to which total quality management was applied and the impact that it had on the overall performance of Sudanese organizations that constructed things, as well as create a practical, systematic model that could be utilized by both Sudanese organizations that construct things and other organizations that seek to improve their performance. This investigation concluded that the instrument's effectiveness is constant and reliable, therefore, other scientists can utilize it to measure the impact of total quality management in other organizations that construct things, and that the implementation of total quality management has a positive effect on all aspects of the organization's overall performance (satisfying employees, producing quality products, satisfying customers, and strategic planning). Leadership is considered the central figure in decision making, however, the lack of a committed, integrated, strong tool that is familiar with the concepts and methods of quality management, organizations cannot augment their performance and develop a whole new level of commitment. Study suggestions: The study suggests that the senior management of construction organizations should commit to providing the necessary resources for implementing a comprehensive quality program, additionally, they should train members of the senior and middle management on the principles and methods of comprehensive quality management, and they should form teams to implement it. The purpose of these teams is to follow up and implement the comprehensive quality management protocol and performance standards. Organizations must first define their intended vision, from which the organization's mission can be derived, along with the rules, procedures, methods and instruments that will lead to the desired goals in the near and long term. The previous study discussed the impact of comprehensive quality management on the performance of organizations, while the current study focuses on the culture of comprehensive quality and the adoption of green costs as a way of measuring the growth and sustainability of industrial facilities.

Study: (Quraifa, 2010)

The investigation intended to propose a viable model for measuring and releasing environmental performance with the intention of testing its hypotheses on companies in the cement industry of Libya. This investigation produced a number of findings following the application of the model in multiple organizations. The most significant of these findings is the lack of professionalism in the accounting profession and the lack of transparency in these organizations. The existence of a environmental strategic plan that includes establishing the goals, means and standards of performance represents the most significant controls for

measuring environmental performance. Conversely, the lack of recognition of environmental performance via the lack of standards for accounting and the diversity of environmental performance components makes it difficult to measure objective performance. The method of accounting for environmental performance is intended to convert environmental variables into numerical values and financial metrics in order to create indicators that can assess the environmental performance of companies that specialize in cement. Ultimately, the most important form of environmental accounting is to require mandatory reporting of environmental performance via laws and regulations, this will focus on the most important and essential information in order to avoid misleading users of accounting information. The previous investigation concerned measuring and releasing the environmental attributes of organizations, for example. the degree to which measuring and releasing environmental expenses is considered. The current investigation concerns the culture of total quality and its utilization to gauge the costs of greenhouses and their impact on the expansion and perpetual nature of industrial enterprises, e.g. the magnitude of the culture of total quality and its impact on measuring environmental costs and their reflection on continuity and growth, negatively or positively.

Study (Lulu: 2016):

The investigation intended to determine the degree to which components of environmental cost accounting are accessible to companies that implement environmental cost accounting, and the importance of this to reduce environmental issues. The most significant findings of the study are the lack of environmental awareness among the senior management in industrial companies in a sufficient manner to utilize environmental cost accounting, and that the level of commitment of the senior management towards the environment in these companies is not considered sufficient to utilize environmental cost accounting. The investigation recommended that environmental awareness should be increased and that workers in industrial companies should pursue efforts to spread the knowledge and create legislation regarding the preservation of the environment and its natural resources.

The previous study discussed the availability of environmental cost accounting in companies that operate in the Gaza Strip, while the current study discusses the culture of total quality and its implementation to measure the cost of greenhouses and its effect on the expansion and duration of Sudanese businesses.

Study (Al-Rakabi: 2014 AD):

The investigation intended to demonstrate the importance of accounting branches including (cost accounting, management accounting, natural resources accounting, financial accounting, and national income accounting) in preserving the environment and thus achieving sustainable development. The investigation revealed that there is a lack of coherence in the conceptual framework of financial accounting regarding the preservation of the environment and support for sustainable development. The previous investigation discussed the response of accounting to promote environmental conservation and facilitate sustainable development. The current investigation concerns the culture of total quality and its utilization to gauge the costs of greenhouses in Sudan and their effect on the expansion and perpetual operation of these establishments.

Study (Aidouni: 2014 AD):

The investigation intended to determine the levels of the information system and decision making within the context of sustainable development in regards to Algerian iron and phosphate companies. The investigation concluded that information systems have a role in the environmental decision making of sustainable development in regards to Algerian iron and phosphate companies. This is attributed to the strategic activity of institutions, which is characterized by its negative impact on the environment and the pressures placed on the state and the public at large.

The previous study discussed the importance of the information system in the decision-making process regarding sustainable development, while the current study focuses on the culture of total quality and its application to the measurement of green costs and its impact on the development and perpetual nature of Sudanese businesses.

Study: (Gamble et al: 1996 AD)

This investigation intended to explore and assess whether or not the disclosure of environmental costs (green costs) by companies that are supposed to have a negative impact on the environment and that are listed on the American stock exchange is sufficient and appropriate for investors in the securities of these companies. The environmental disclosure was scrutinized and assessed for a sample of these companies, which included twelve different industries from the time period (1986-1991 AD). Among the most significant findings of the study is that companies involved in certain industries, such as oil refining, chemicals and waste, have a large amount of information available regarding their pollution control efforts, particularly in the last three years, this information is of higher quality when the company is listed on the New York Stock Exchange. Ultimately, the investor who chooses which stocks to

purchase is dependent on the information regarding the environmental performance of companies involved in combating and preventing environmental pollution.

The first axis: Total Quality:

Total quality is considered to be the belief that is cultivated in the leadership and operation style of an organization with the intention of improving performance over time by focusing on the demands of customers while also taking into account the requirements of shareholders and other stakeholders. The Federal Quality Institute describes it as being both practical and intended to achieve the customer's needs and wishes, using quantitative methods to improve operations and services continuously.

For the American perspective, M TQ considers total quality management to be a philosophy, principles and guidelines that direct the organization towards continued development. These are additional methods that quantify resources and services as well as human resources that augment the utilization of resources and services within the organization. All of this is done in order to achieve the goal of meeting the needs of current and potential consumers.

The researcher believes that total quality management is a comprehensive approach to quality management that involves the activities of multiple institutions. It's designed according to basic principles and rules that promote continual improvement and that attempt to achieve the goals of multiple institutions, this approach ensures growth and sustainability.

Total quality management objectives:

Cost reduction:

The quality of something is measured in terms of how it performs various functions correctly the first time. This includes reducing the damage associated with items or re-doing them to reduce the cost, the researcher believes that the philosophy based on the fact that completing tasks correctly always leads to a reduction in the cost of loss and repairs, and all of this ultimately leads to a reduction in the overall cost..

2- Reducing the time required to complete tasks for the customer:

Many of the methods employed by the institution to provide services to customers focus on monitoring the goals and making sure they are achieved, this negatively affects the customer. As a result, one of the primary objectives of total quality management is to reduce the amount of time needed to complete tasks for the customer, the researcher previously mentioned that eliminating loss and modifying the process of doing things necessarily leads to

a reduction in the total time needed for the production process and then to a completed transaction with the customer..

Achieving quality:

This is accomplished by creating products and services that satisfy the customer's desires. Attention to quality is lacking, which leads to increased time needed to complete tasks and complete the project, as well as increased monitoring of the project, this leads to increased complaints from the beneficiaries of these services. The concept of quality is known as quality, which is a comprehensive framework that includes all of the transactions associated with the production process, from the time of creation to the cost of appropriate transactions, all of this affects the continued operation of establishments and the expansion of their markets by attracting new customers. The investigator believes that this is the primary purpose of implementing a culture of quality that is comprehensive in nature. The basis of Total Quality Management:

The principles of total quality can be summarized as follows:

1-focus on the customer : The customer is considered the most important component of total quality management, as research participants agreed that the customer is the paramount focus of all activities associated with total quality management, the Malcolm Baldrige International Award awarded 25 of its marks to the organization's concern with customers and honoring their desires, and the term customer in total quality management refers to both the internal and external customer, the external customer is the consumer or customer, whether individual or institutional, around whom all activities and efforts are dedicated to fulfilling his desires and motivating him to purchase the product, while the internal customer is the employees of the various organizations in the organization (workstations, units, departments, etc.), and these workers are considered customers of those who came before them and suppliers to those who came after them, as the British Quality Organization views customers more comprehensively, as it defines them as investors, workers, partners, suppliers and any other party associated with the organization, therefore, the organization should take into account the activities that benefited the customer, whether internal or external. High quality should be recognized and increased his faith in the institution and increased his loyalty and satisfaction.

The researcher believes that the axis of quality around which all of the programs, standards, and client programs revolves, with its primary goal being to achieve customer satisfaction. The client is a complex term that encompasses all of the participants in the facility's supply chain, including the suppliers of raw materials that are used in industrial facilities or goods, as well as the directors, employees, and service providers. The end

customer, taxes, and users of financial statements are all considered part of the client. It's important to note that if the satisfaction level isn't achieved by one of the component of this circle, the entire quality will be affected, this is reflected in the continued development and growth of the facility. However, if satisfaction is achieved, this will lead to maintaining the average level of the facility and increasing the growth rate of facilities in general, which will lead to the continuity of the facility. The factors that contribute to development in the market should be considered when attempting to reach the end customer in order to provide them with an element of keeping up with the latest.

Continuous improvement:

The philosophy of total quality management centers around the idea that every functional activity and management process in the organization should be improved upon. This principle centers on the hypothesis that the ultimate quality is the result of a series of connected improvement steps and activities. The most important component of this series is to research the market, this will help to direct the improvement towards a more developed market and to emphasize the continued, then the continued development of market demands.

Cooperation and collective participation:

All-inclusive quality management is dependent on collaboration in the performance of duties, whether at the same level of administration or between different levels of administration. This conveys information between administrative departments and organizational units, and perhaps the Japanese quality circles method is an example of this collaboration system.

Preventing errors before they occur:

This principle centers around the quality of the process's performance as well as the result, this is in order to prevent instances of deviation from the specifications and to achieve the goal of preventing mistakes before they occur, utilizing acceptable instruments and methods of measurement and analysis such as control charts, Pareto analysis, cause and effect diagrams, and other methods used to regulate the quality of processes and results. thus reducing costs and time.

Supporting and training employees:

The efficacy of total quality management is dependent on the effectiveness of employees, through training and encouraging them to achieve growth, gain experience and knowledge, and cope with change. Other research has demonstrated that employees enjoy receiving compliments, gratitude, and care in exchange for their efforts, this is considered to

be one of the most fundamental components of total quality management. The quality circles method is one of the approaches that attempt to inspire employees to enhance quality and increase their sense of association with the organization.

The researcher also suggested that employees are part of the customer's circle, as a result, caring for them via incentives that fit them all will have an effect on the total quality achieved.

Making decisions based on facts:

One benefit of institutions that implement Total Quality Management is that their decisions are based on factual information, rather than on individual predictions or speculations. To get accurate results and understand the degree of deviation, Total Quality Management employs multiple statistical instruments for this purpose, including:

A pareto map, flowcharts, Ishikawa maps, Shewhart circles, and other practical tools that facilitate the development of multiple strategies for the institution, not just for simple decisions.

This is also involved in the analysis of the planned standards for each component of the principles that were actually achieved, as well as making decisions based on the results of the comparison.

Requirements for the success of Total Quality Management:

To **achieve Total Quality Management, a set of requirements must be available, which are**:

1- Help and approval of the highest management for the Total Quality Management system.
2- Creating a culture of work and an organization's values for all employees.
3- primarily concerned with the beneficiary.
4- Constant measurement of performance during employment.
5- Including quality in the planning process for the organization.
6- Constant education and training for all employees, including the senior management.
7- Effective management of human resources.
8- Constant improvement of quality.
9- Including all employees in the efforts to increase performance levels.
10- Creating a comprehensive information system about Total Quality Management..

The researcher believes that the greatest importance is the approval of the top management, because no steps can be taken in planning or implementing a Total Quality Management strategy without the approval of the top management.

The contrast between traditional management and Total Quality Management:

The culture of administration differs from the culture of management, the latter is based on Total Quality, and the classification of this difference is listed in the following table:

Table No. 1

Comparison between traditional management and management based on Total Quality

Total Quality Management	Traditional Management
Self-Control	1/ Close supervision and nitpicking.
Teamwork and Team Spirit	2/ Individual work.
Focus on Product and Process	3/ Product focus
Employee Engagement	4/ Employee involvement
Continuous Improvement	5/ Improvement when needed
Flexibility of Policies and Procedures	6/ Rigidity of policies and procedures
Data Analysis and Environmental Benchmarking	7/ Data storage
Focus on Customer Satisfaction	8/ Focus on profit
Supplier Involvement in Total Quality Management	9/ Viewing suppliers as exploiters
Internal and External Customer	10/ External customer
Extensive Experience Through Teams	11/ Narrow expertise depends on the individual

Quality, Mahfouz Ahmed, Total Quality Management Concepts and Applications, Wael Publishing House, Amman, Jordan, p. 44.

The most prominent stages of total quality management:

To achieve total quality, it must go through a number of stages, which are as follows:

Table No. 2

Stages of total quality management

Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the organization and its	Quality Assurance	Statistical Control	Scientific management	Stages / Features

environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.				
Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the organization and its environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.	Quality Assurance	Quality	Determine deviation or error	Interests
Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the organization and its	During	Quality Control	(Error detection)	Time period

environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.				
Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the organization and its environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.	the	Final Product	Beginning of the twentieth century	To launch the stage
Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the	Production	Early 1930s	Quality inspection	Models and techniques

organization and its environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.				
Total Quality Management The comprehensive facilitation of the quality of inputs, processes and outputs in the organization. The early eighties. The formation and motivation of the human element, all members of the organization and its environment. The emergence of this concept was paved by Deming and Juran, Corsby and Feigenbaum.	Process	Probability	By matching the quality of the finished product with the pre-determined standards	Basic

Mozaoui, Samia, entitled (The position of human resources management in regards to ISO standards or total quality management), a unpublished master's degree, awarded in 2003 to Samia Mozaoui.

The full list of quality management points:

Deming documented principles that he believes are essential to the successful implementation of total quality management:

1- The consistent nature of the objectives that are intended to improve the quality of the product or service that is provided and to assign responsibility to the management.
2- Adopting a new approach by the senior management.
3- Cease all reliance on a comprehensive exam to regulate quality and begin to create a superior product from the beginning.

4- 4-2: Avoid basing your decisions on the lowest price, instead, rely on quality.
5- Reducing expenses by improving the production system constantly in order to increase quality and productivity.
6- Discovering the integration of modern methods and on-the-job training.
7- Increasing the capacity of supervisors to lead.
8- Removing the fear of failure from employees and making them always seek to improve their efficiency.
9- Destroying the boundaries between the organization's departments and working as a team in order to achieve appropriate quality and productivity.
10- Cease advertising campaigns, messages and numerical objectives that are unable to accomplish the intended goals.
11- Remove standards of work that specify the specific production numbers regardless of quality or focus on assistance, improvement and support.
12- Remove obstacles that prevent workers from expressing their self-esteem and pride.
13- Create a program for educating and training that will lead to improvements.
14- All members of the organization should be placed in positions that will facilitate the transformation process.

The second axis:

Green costs:

Environmental costs (green costs) are defined as: costs related to the actual or potential deterioration of natural and environmental resources arising from economic activities.

Green costs:

They are also characterized as recognizing and measuring the expenses associated with environmental activities, and utilizing this information in the decision making process of agencies with the goal of reducing or eliminating the negative environmental effects of activities and environmental systems. In accordance with the polluter pays principle, this is done.

It's also considered to be (the monetary or non-monetary costs associated with the facility as a result of its environmental activities that are affected by them. These expenses include the traditional costs associated with buildings, equipment, materials and labor, as well as potential indirect costs (which are recorded on an indirect basis), indirect costs and slightly tangible costs (which are not easily measured, for example, potential commitment costs or enhancing the facility's reputation).

Methods of calculating environmental costs (Green costs):

Non-monetary measurement is characterized by the association of numerical values to objects or events in accordance with specific rules that include the following measurement systems:

The ordinal measurement system: It's derived from organizing things or financial or cost events in a way that they are the largest or smallest component of the property being measured.

2- The quarterly measurement system, which is employed to gauge the deviation from the legally required standards regarding environmental impacts. To accomplish this measurement, several steps are defined, which are then arranged:

A- Discovering the maximum volume of polluting substances that can be released, expressed as a volume of water (K T H M). The investigator believes that these quantities are similar to the cost of science called permissible cost or natural loss, but these quantities are in the components that pollute the environment and are not controllable by the various facilities.

B- Discovering the actual amounts of pollution components and represented by the symbol (K Th F), the researcher believes that this symbol should first be determined in order to make a trade-off between the expected and the actual quantities of pollution components, this will lead to a determination of the deviation and the need for control of the costs.

C. First, the elements of pollution that cannot be controlled or removed are identified, these are called the symbol (K Th G), which is the excess of pollution, and as the researcher previously mentioned, it's necessary to contrast the actual and the expected value, the result of this comparison is the cost of unallowable costs, which is higher than the planned value.

3. Relative measurement system: It's employed to gauge the effectiveness of environmental performance in certain instances, such as determining the frequency of injury that indicates the degree to which multiple injuries affect workers in a particular period of time.

4. Descriptive (qualitative) measurement approach: This approach is derived from the structural description of the properties or symptoms of a specific event, this allows the reader to visualize the event in its natural state. This approach is considered simple and the most practical of the environmental measurement field. The cost is the least of all methods. It is based on narratives that are not limited by specific rules and describe the environmental activities of the facility in a style that is descriptive of the facility. However, total reliance on

it in the environmental field of measurement does not provide an objective assessment of the environmental effectiveness of the project.

Obstacles to measuring and disclosing environmental costs:

The procedure of measuring environmental (green) costs involves several steps that each have their own obstacles and issues. These steps and their issues are as follows:

1-Detecting the direct relationship between the criminal's actions and the resulting damage: This element has multiple drawbacks.

A- distance: It's not possible to precisely determine the distance between the damage and the place where it occurred, such as the air or water pollution associated with radioactive waste or smoking, or specific limits on the subject.

B- Estimating compensation: It's difficult to estimate the compensation for certain instances of pollution, such as chemical pollution, which appears after several years, thus it's difficult to reduce the size of the loss and damage immediately after they've occurred.

C- The difficulty in recognizing the different types of pollution: In some instances, it is difficult to determine the origin or type of pollution that causes the damage, which is a result of the interaction of multiple types of pollution, such as in the case of river water pollution caused by the dumping of waste or the drainage of factory water.

D- The difficulty in decreasing the effects of pollution: It's scientifically documented that pollution sources don't always have the same effect, because natural conditions have a significant role in this area, as the dumping of polluted waste into the river doesn't lead to the same damage when water moves.

The conflicting perspectives of the facility and society regarding environmental costs are discussed.:

When the facility considers the costs of pollution damage as the cost of treatment that it carries out regardless of choice or in accordance with laws that its economic activity is not dependent on, plus the lack of an economic return for these costs, society considers these costs as the value of the damage that it suffers as a result of the facility's economic activity, which is why it's difficult to quantify the cost of pollution damage, and translate it into a monetary value that represents the damage, and convert this cost into an internal cost for the project via planning and execution of pollution treatment programs.

D- Difficulty in estimating the monetary value of environmental damages: It is difficult to estimate the monetary value of all environmental damages, some of which have a market value,

such as the loss of fish and coastal assets, and others do not have a market value, such as the health damage caused by pollution.

F- The desire of economic units to maximize profits to their maximum potential:

This necessitates reducing expenses to the greatest extent possible (assuming other components are constant), as a result, the economic unit should only produce costs without taking into account the social costs of environmental pollution.

G- The absence of the essential information to calculate environmental costs:

For example, the depreciation of natural resources and the production of pollution, because there is not enough information to quantify or evaluate them in a material way, or to document them in a dual entry system, these issues become problematic.

H- The absence of a universal standard for the accounting of environmental costs.:

As there is currently no universal agreement about how to account for environmental expenses that are not accompanied by a return of cash, this special class of expenses is not well documented.

D - The difficulty of associating environmental costs with environmental benefits:

The procedure of measuring the company's economic performance is to contrast the monetary costs of the performance with the monetary benefits and advantages gained from the performance during the same period, and then to assess the potential for the business results to be reported via numbers and profits at the conclusion of the period being measured. Despite the significance of measuring and reporting on the company's environmental performance return, the environmental benefits that are derived from the company's expenditures are considered the supplemental part of the equation that measures the company's social contribution.

J - Lack of strategic environmental plans:

strategic environmental plans have a significant role in environmental measurement. Without universal standards for the evaluation of performance and others, it is impossible to assess the advancement of environmental performance, compare it to the standard levels of environmental performance and evaluate it.

K- Difficulty recognizing the components of environmental (green) costs and differentiating them from other costs: Many issues are involved in the subjection of the components of environmental costs to accounting methodology, given that all of the costs associated with the activity that results from the facility's environmental responsibility are considered environmental costs, but in fact, recognizing and measuring these components and reporting on their results is plagued by many practical issues, the issue primarily stems from

the facility's responsibility towards the environment as a result of its activity. The facility's commitment to the environment is still an undefined concept that has not been scientifically determined yet..

The third axis: Growth

The growth of establishments is considered a part of their life cycle. Different establishments will have different life cycles, including products that are characterized by a progression of stages, including the growth stage, during which demand for the product increases, the price of the product decreases, and profits are stable. Growth is considered the second stage of the life cycle of an establishment, this stage is represented by the initial or final stage, then the growth stage, the mature stage, the fluktuation stage and finally the deterioration stage. The maturity stage is the period during which establishments must remain in place and increase their growth while maintaining a cautious approach. (It's important to note that growth and consistency in it refers to the continued operation of establishments, and it's one of the most significant goals that establishments want to achieve and maintain.)

Growth measurement:

There are a number of measures used to measure the growth of establishments and other stages of their life cycle, which are as follows:

A.Age of Establishment: Some investigations have employed the age of establishments as a financial indicator to demonstrate the different stages of the life cycle of establishments during the financial and accounting effects of the life cycle of establishments. However, using the age of the establishments as a means of measuring the progression of the life cycle of establishments is an incorrect approach for several reasons; the first is that the time required for an establishment to transition from one stage to another is dependent on the industry (as a result, it is not possible to create a single measurement that is used for all establishments). Second: The difference in the time needed to acquire specific abilities makes some companies take less time than others, the difference in the learning curve associated with each company (along with the physical capabilities of the location) causes some to take less time than others.

Third: Studies typically utilize the number of years since the listed company's founding in order to determine the age of the company, although many companies have existed for a long time and transitioned from one stage to another in the life cycle before being listed on the stock exchange (in addition, the company may not have originally been listed on the

stock exchange, which makes it difficult to utilize this measure). As a result, the belief that establishments progress through the life cycle stages is a false concept.

B- Retained income: The ratio of the final balance of retained income to the total value of assets at the end of the period is used to determine the company's life cycle stages, by increasing the previous ratio or one of its components, the company will move from one stage to another in its life cycle, and the closer the previous ratio is to the average of the industry, this indicates that the company is nearing the end of its life cycle, therefore, it is not a good indicator of the company's life cycle. The researcher believes that the outcome of this measure is likely to be incorrect because the value of the book is recorded at the historical value of the asset, and the retained earnings are valued at the current value of the asset, thus there is a difference in the measurement of the two components of this measure, and as a result, an incorrect value is derived.

Correct Growth rates: Some research has demonstrated a method of measuring the progression of the company's life cycle based on the growth rates of both sales operating income, and capital expenditures. These rates are employed to categorize organizations into multiple stages of the different life cycles. Despite the fact that growth rates are a viable means of expressing the progression of the company's life cycle through which the company transitions from one stage to another. However, this model is limited by the fact that the use of growth rates to measure the progression of a company's life cycle is limited by the need to build these rates over a minimum of six years, this reduces the possibility of observing companies during the initial stage in particular.

Second: The classification based on growth rates associated with company size, sales, operating profits, and capital expenditures is generally considered to be inaccurate, because these rates failed to recognize the distinct stages of the company's life cycle when applied in some studies, specifically in situations that differ from the basic environment on which the study was conducted, this is for joint stock companies that are registered on the New York stock exchange, and the results of which were utilized to generalize the model.

Cash flows: The Dickinson model is based on the annual data available from the cash flow statement, this is the most popular of these types of models because it provides evidence that the cash flow signal represents a difference between the different stages of the company's life cycle, it also represents the company's profitability, growth, and risk. As a result, cash flow data derived from operational activities, or investment, can be employed to assess the phases of the company's life cycle; these phases are derived from the initial stage, through the decline stage. It's important to note that the company's profit growth rate is crucial to the life cycle

stages. Studies of a collective of private and public companies that are jointly owned by both the public and private sector in the U.K. and the U.S. have demonstrated that the profit growth rate can be represented by a curve that grows, then stabilizes, then decreases over time for the company, and that profit rates increase with age and remain high for a few years, then decrease slowly when the company reaches maturity, then begin to decline when the company reaches the decline stage. The researcher believes that increased profit is primarily caused by the growth of companies to a significant degree, but He believes that the two are intrinsically linked, as increased profit is directly related to the growth of the establishment, e.g. The company is still expanding in the market, and has recently begun to operate in the South American country of Brazil. Additionally, Adam Smith's law of the fittest is more commonly followed.

Fourth axis: Continuity.

When discussing continuity, the discussion is centered on the assumption of continuity, which is one of the most commonly recognized accounting conventions (GAAP), on which the financial statements are based. It's common knowledge that the application of one of the accounting principles or assumptions results in requirements that are apparent on the financial statements. The assumption of permanency is employed to differentiate between assets that are fixed and current (or liquid). By continuity, we refer to a continued operation and no desire to halt or liquidate at a specific date. As a result, the establishment may not prepare financial statements that follow the assumption of permanency if the management wishes to halt the practice of the activity and liquidate the establishment at the same time.

The necessity of maintaining consistency in lieu of change:

Imposing continuity is the consistent establishment of things, which is important to the parties involved or who take advantage of the production process or the profits it provides. The necessity of maintaining continuity is summarized in two significant points.:

1. Some users of financial statements have expressed concern that the auditors will not be able to provide early warning signs about the potential problems associated with the near future's failure.
2. Being around legal crises caused by auditors' mistakes regarding the expression of their opinions regarding the company's ability to continue its operation, as well as their reputation.

Additionally, two components of continuity are involved: one is international standards, which concern:

1. On the whole, the degree of uncertainty regarding the specific results of an event or situation increases as the future period during which the results are expected increases.
2. The personal judgment of the researcher regarding the future is based on the information available when creating this estimate, which may conflict with the apparent reasonability of the date on which it was created (the researcher believes this is due to the large degree of personal experience involved in the estimation of these events, which is different from the way that managers and accountants think, which results in different structures of administrative organization). The continuity theory may be vulnerable to a number of dangers that threaten the continued existence of establishments, these are: internal and external dangers.

Internal hazards:

These dangers are internal to the establishments' conditions regarding employees and their families, as well as management's policies and guidance. Additionally, internal operations are also hazardous. These dangers can be confined to the following:

A- financial events and conditions, such as the presence of negative net working capital (which means that current liabilities are greater than current assets), the lack of realistic expectations regarding the renewal of contracts or the payment of fixed term loans, the presence of indicators that indicate the rejection of lenders from continuing to support the development of a new product, the presence of a cash deficit associated with the operation of the business, the lack of ability to pay back the debt on the due date, the inability to follow the terms of the loan agreement, the development of a new product or investment that is necessary, the development of a new business model or the inability to pay back the debt on the due date.

B- Occurrences and circumstances that lead to operational issues, such as the vacant position of a senior management member without an alternative, the loss of a significant market, a franchise or license, or a major supplier, all of these problems can lead to issues with the labor department or the failure to procure important supplies.

C- Other occurrences and circumstances: represented by the failure to achieve the capital requirements for survival or other legal obligations, the presence of lawsuits or legal processes against the establishment, these can be classified as either of the two categories: lawsuits that are unable to fulfill the obligations associated with them, or legal processes that are in favor of others.

2- External hazards: They are categorized as hazards that cannot be averted, for example. utside of the jurisdiction of the establishments, there are also instances where government policies, taxes, regulations, and labor unions that are external to the jurisdiction of the government directly affect the establishments and their suppliers, shareholders, dealers, and banks or other

financial institutions. These institutions directly affect the continuance of the establishments and their impact on the government.

The primary axis of growth or continued success for any project is the customer, their entire internal and external customer base, as well as the primary focus of interest in all quality systems, the customer is part of the system and seeks to please them. Today, the world is experiencing pollution as a result of industrial development and consumption. Customers have begun to pay attention to green products that serve to preserve the environment, this may affect the continued operation of the facility as well as its growth, customers have begun to demand green products that have a environmental role and produce lines that are environmentally friendly, these products may also increase the market share of the facility. This is accomplished by creating a specific system of measurement for green costs in order to establish principles, rules and standards regarding comprehensive quality. Green costs are not limited to the costs associated with environmentally harmful production or waste disposal, but include the additional costs of producing green products and the revenue gained from selling these products. All of this is undoubtedly associated with the continued evolution and growth of facilities.

3. RESULTS AND RECOMMENDATIONS:

1.- Adopting a culture of total quality management regarding green costs will enhance the sustainability and growth of industrial companies in Sudan.

2- Sudanese establishments, especially those in Khartoum, have little concern for green costs and have a limited focus on green products.

Many Sudanese institutions follow traditional planning methods that lack a total quality system as their foundation.

4- Sudanese establishments don't currently measure their position on the growth and continuity graph on a regular basis, instead, they follow the rules of the job market.

Total quality in its implementation necessitates the participation of senior management, which is considered paramount to the total quality management system.

6- It's hard to differentiate and quantify the costs of greenhouses, and it may be difficult to predict these costs.

7- Green costs are the result of any environmental damage, these costs are monetary or non-monetary in nature.

8- Disparate views between the management and customers regarding green costs may lead to harm to the continuity of the establishments or a loss of their customers, because the focus of the establishments' interests is the customer and their actions are dependent on him.

Recommendations:

The researcher recommends the following:

1- The necessity of Sudanese establishments' interest in management systems based on total quality due to their impact on the continuity and growth of industrial establishments.

2- Paying attention to green costs as the modern trend of cost according to market requirements and determining standards and measures for them in accordance with the total quality management system.

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