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The Importance of the Integrative Relationship Between Cause and Effect Analysis
and The Sustainable Balanced Scorecard in Solving Problems of Economic Units

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ABSTRACT

The aim of the research is to highlight the complementarity between cause-and-effect analysis and the Sustainable Balanced Tag Card. The problem with the research is that economic units are poorly aware of the theoretical and philosophical foundations of cause-and-effect analysis and their importance in costing and solving administrative problems and inadequate attention to financial and non-financial measures.

In order to achieve the objective of research and test its hypotheses, the Wasit Textile and Weaving Plant of the State Company for the Textile and Leather Industries, located in the centre of the Wasit prefecture, has been selected as a centre for research.

Its performance has been evaluated and a model has been presented to solve the problems it faces through a cause-and-effect analysis scheme with a sustainable balanced tag card (SBSC) that details all environmental and social aspects, both quantitative and financial.

A set of conclusions has been reached, the most important of which is that the cause-and-effect relationship is not just a correlation, but a reasonable relationship between the level of the activity and its costs, because it gives analysts and managers confidence in the relationships repeatedly estimated in other sets of data, The identification of cost guides gives managers a vision of several methods they use to reduce costs and the quantity of routers, and the sustainable balanced labeling card uses both financial and non-financial performance measures to bridge the gap arising from the use of financial measures only, as well as to measure and improve performance , The economic unit wishing to take advantage of the characteristics of the adopted economic unit strategies that are relevant to each dimension of the sustainable balance tag and its drawbacks should be careful not to reduce the costs of products or services on an ongoing basis, and focus not only on reducing costs, but also on providing distinct products and services that meet the requirements and needs of clients.

Keywords: *cause and effect analysis, Sustainable Balanced Scorecard, cost reduction, cost management strategies, product quality.*

INTRODUCTION

When you have a problem, what's the first thing you do? Are you looking for a solution? If your answer is "Yes," you will be in the wrong direction, if many studies prove that searching for the cause of the problem is always the best decision, that is, looking for the root of the cause of the problem and not just part of it, that's why a tool called cause-and-effect analysis has emerged. It helps to solve problems effectively, relying on a tool (CEA) based on a combination of drawing and mind-blowing with a so-called human mind map, as it can help to look more deeply for the cause of the problem rather than just showing what's clear. The current business environment is characterized by a number of characteristics and characteristics relating to the expansion of market size, increased competition as well as modern technological development, the emergence of new economic units and the demise of other economic units and products, The diversity and diversity of production offerings, among others. All of these factors have contributed to the emergence of new drivers in economic units. The technological revolution and the modern manufacturing environment have had a significant impact on the evolution of cost accounting represented Recent developments in cost accounting, the emergence of the term cost management and the accompanying emergence of cost management techniques, cost accounting has enabled the use of cost management

techniques to service economic units, especially after the widespread use of sophisticated and electronically controlled machines and the use of flexible and integrated manufacturing systems to reach the plant is automated , Based on these changes and developments, new cost management techniques have emerged in recent years in response to these changes and developments, Because economic units always seek to maintain and protect their position in the market, these techniques and methods can support the success factors and competitive advantages of their economic units through their alignment with developments and changes in today's world.

FIRST: ANALYSIS OF CAUSE AND RESULTS: HISTORICAL PROFILE, GENESIS AND DEFINITION

Cause-and-effect analysis is one of the seven core quality tools developed by Goetsch & Davis in organizational quality management, and the only underlying quality tool not based on statistics. Goetsch & Davis, 2010: 260)), Because they are involved in solving the problem by understanding causality, "the interaction of multiple inputs and contexts, rather than simply interpreting the problem and its potential solutions by analysing statistical data, which is why the analysis of cause and result has a wide range of potential uses. According to Liliana, "The Analysis of Cause and Effect" was invented by kaoru

Ishikawa in 1960 (Liliana, 2016: Hekmatpanah considers that it was developed in 1968 (Hekmatpanah, 2011: 10901) , Ishikawa considers that it was developed in the summer of 1943 (Ishikawa, 1976: 26), also known as the Fishbone Diagram, or Ishikawa Diagram, relative to the world Kauro Ishikawa, who first prepared it at Kawasaki, It is a tool that depicts the classification of the possible causes of the problem in order to determine the root causes of the problem, as the causes of a particular event appear. The cause-and-effect analysis is used to determine the potential factors causing the overall impact of the problem, that is, each vector and cause that creates a difference in output. Grouped into major categories to determine the true source of the difference, The categories can be persons, methods, processes, machines, materials, measurements, environment, equipment, etc. The cause-and-effect analysis tool can also be used to effectively divide any problem into a matrix of causal relationships and is best used to determine the cause once you have the main definition of the problem .George et al., 2005: 85)).

The analysis of cause and effect contributes to the preparation of the Quality Control Group. Many individuals can provide suggestions and views on the nature of the causal factors that most affect the identification of the problem, using the analysis of cause and effect to consider all possible causes rather than just the apparent and familiar causes, However, it is

important to note that cause-and-effect schemes are one of the tools of brainstorming (George, 2002: 29), cause and result analysis is also one of the most important tools in quality control. They can be used in different administrative levels and workplaces, from workers to quality teams through maintenance teams in economic units, and Japanese factories use the CIDAC system)((Carads)Cause and Effect Diagram With Addition) As an extension of the analysis of cause and effect, staff have begun to use the OET method on the ground along with the CEDAC system, Another method used to improve quality is error training and the idea that everyone should learn from failures is measured by the combined impact of PCAC and OET methods on the number of failures (Dahlgard, 2002:50).

From the above, it is concluded that the origin of the analysis of cause and effect belongs to the Japanese world of Kaoru Ishikawa in the '60s. The analysis of cause and effect is also found to have more than one name (Ishikawa, fish bone, cause and effect) and is particularly designed as one of the tools of quality management and is heavily involved in problem solving.

SECOND: CONCEPT OF CAUSE-AND-EFFECT ANALYSIS

Outstanding and leading economic units seek to continuously improve their products and services, using cause-and-effect analysis to

identify and publicize underlying and root causes and one of the important strategies that can be used at the individual level, as well as in the public and private sectors, They are effective in finding out the causes, and then analysis of cause and effect is important in improving processes, as well as in making decisions and analysing difficulties. For example, where there are financial pressures

and to know what the causes of stress are at the individual level, Analysis of cause and effect helps to improve both individual and institutional performance, as well as in all areas of life (2 Goetsch & Davis, 2010: 26). Table (1) shows the definitions of cause-and-effect analysis by some researchers or writers and agencies:

Table(1): Definitions of cause-and-effect analysis

Sources	Definition
(Payne:2004:3)	A tool for visualizing multiple stages of weighted (possible) causes and apparent effects during the work..
Evans& Lindsay,2008: 682	An important tool in generating ideas, to solve problems and identify their causes for correction.
Leavengood&Reeb,2009:2	A graphical tool for regulating the ships between different theories and presenting them to the root cause of the problem.
(Ciocoiu et al.,2010:2)	An analysis tool that provides a systematic way of looking at the effects and causes that create or contribute to those impacts.
(Keyes, 2011: 27)	It is one of the most useful quality tools for identifying the root problems of processes.
(Masejane,2012: 71)	An important tool that helps generate ideas to solve problems and serves as a basis for finding solutions.
loredana ,2016:100	A method used to analyze complex problems using visual representation and brainstorming techniques to figure out the causes of the problem.
Neyestani,2017:5	A tool for systematic verification and analysis of all causes and problems leading to a single effect
Datar & Rajan,2021:388	The most important factor in estimating the cost function by identifying cost engines such as the activity level is a variable that has a causal effect on costs in an attempt to estimate, predict and manage them.

THIRD: SUSTAINABLE BALANCED TAG CARD: GENESIS AND CONCEPT

One of the most important criticisms of the balanced label is its disregard for both dimensions (environmental and social), given the need for this type of dimension for many Iraqi economic units. Recent surveys have

shown that this tool is being used by about 50% of economic units and the BSC model has been developed into the SBSC, a system designed to manage and implement economic unit strategies (Michaela & Špičková, 2010: 290) ‘Table(2) shows the importance of adding a sustainability dimension to the dimensions of a balanced tag.

Table (2): Sustainability of balanced tag dimensions

<p>Internal Operations perspective</p>	<p>Assistance to oversight systems, responsibility and transparency. It helps them get the job done right.</p>	<p>Gives high value to potential customers and classifies competitors. It's a source of knowledge of customers' desires and expectations.</p>	<p>Customer perspective</p>
<p>financial perspective</p>	<p>Supports the continuity of Iraq's economic unit. She's involved in attracting investors on remote photography.</p>	<p>It helps satisfy customers. It's given some sort of ease in doing the job. Support in the statement and description of the rules of work of the Economic Unit</p>	<p>The perspective of learning and growth</p>

Source: John O'Rourke: "Sustainability Matters Oracle Corporation", March 2011, P8, U.S. A



In order to add sustainability to the balanced tag, the sustainability of an economic unit is defined as the ultimate outcome (TBL). It refers to the need to take into account environmental and social impacts as well as financial measures, whereas the main objective of sustainability is to promote all dimensions simultaneously (i.e. to integrate them), Sustainability is often added to the more important aspects of the strategies under study for economic units (Hansen & Schaltegge, 2012: 9, the addition of all sustainability measures for the four dimensions of a balanced tag gives the different ability and possibilities to create a sustainable balanced tag (7 2002:, Waxenberger & Bieker).

From the foregoing, the addition of the sustainability dimension of the four dimensions of the balanced mark tag is important and necessary, as it is important to achieve growth in environmental and economic aspects in order to survive and sustain for as long as possible, as well as in relation to the analysis of cause and effect, which will be the focus of the discussion in the next paragraph.

FOURTH: SUSTAINABLE BALANCED TAG (SBSC)

Before addressing the SBSC concept, there is a need to identify the meaning of

"sustainability," which means applying and studying knowledge about how to control individuals, society and economic unity in a way that improves human capital (labour), technological, financial, cognitive and intellectual in order to generate value for stakeholders and contributors to the well-being of present and future generations (2018:214 Mandalawi, & Al Kaabi), Their ability to maintain a stable level without depletion of natural resources or causing severe environmental damage, Sustainability refers to the scientific concept that seeks to improve the efficiency with which natural resources are used to meet the human needs of products and services (2020:60, Anthony), It also focuses on meeting the needs and desires of the current generation without compromising the ability of future generations to meet their needs and desires. The concept of sustainability consists of three pillars: Economic, Environmental, Social and Informally Involved in Aspects (Profits, Environment and People (Grant, 2020: 1)).

SBSC is also a comprehensive tool for measuring all aspects of sustainability. This tool provides a cross-sectoral vision within the Economic Unit and uses SBSC to push managers to address all issues affecting the performance of the Economic Unit, including finance and non-finance ,

Therefore, SBSC helps improve financial and non-financial performance, including environmental and social performance, and explains the relationship between cause and effect of non-financial considerations on financial aspects (Abdelrazek, 2019:960).

FIFTH: CAUSE-AND-EFFECT RELATIONSHIP TO SUSTAINABLE BALANCED TAG CARD

An important assumption of a sustainable balanced tag is that each performance measure is part of the cause-and-effect relationship that involves reformulating the strategy of economic unity and translating it into financial results represent the means Cause-and-result relationships by which command measures are integrated, which serves as a mechanism for communicating the strategy that permeates the cause-and-result chain all four dimensions of the sustainable balanced tag. The learning and growth dimension is supposed to be directed to internal business activities and the dimensions of these activities are also directed to the customer dimension, While the fourth dimension is directed to the financial dimension and the environmental and social dimension is geared to all dimensions (Drury, 2018: 57) It is necessary to assume that there is a cause-and-effect relationship because it allows measurements of non-financial dimensions to be used. to

predict future financial performance, as (Kaplan & Norton) sees the strategy as a set of hypotheses about cause and effect, Thus, the Sustainable Balanced Marker Card (SQC) can list the strategy of economic unity through the chain of cause-and-effect relationships. Measurement systems must clarify the relationships between goals and measures in different dimensions of SBSC , So that they can be managed and validated explicitly, every measure chosen for SBSCs must be reflected in a relationship chain (C & A) that transfers the meaning of a unity of action strategy to the economic unit. Cause-and-effect relationships can be expressed through a series of "If That Condition," for example, a link between the training of employees and the development of their multiple tasks for the purpose of achieving the highest profits through the following sequence of police data (Al Bento, 2012:47):

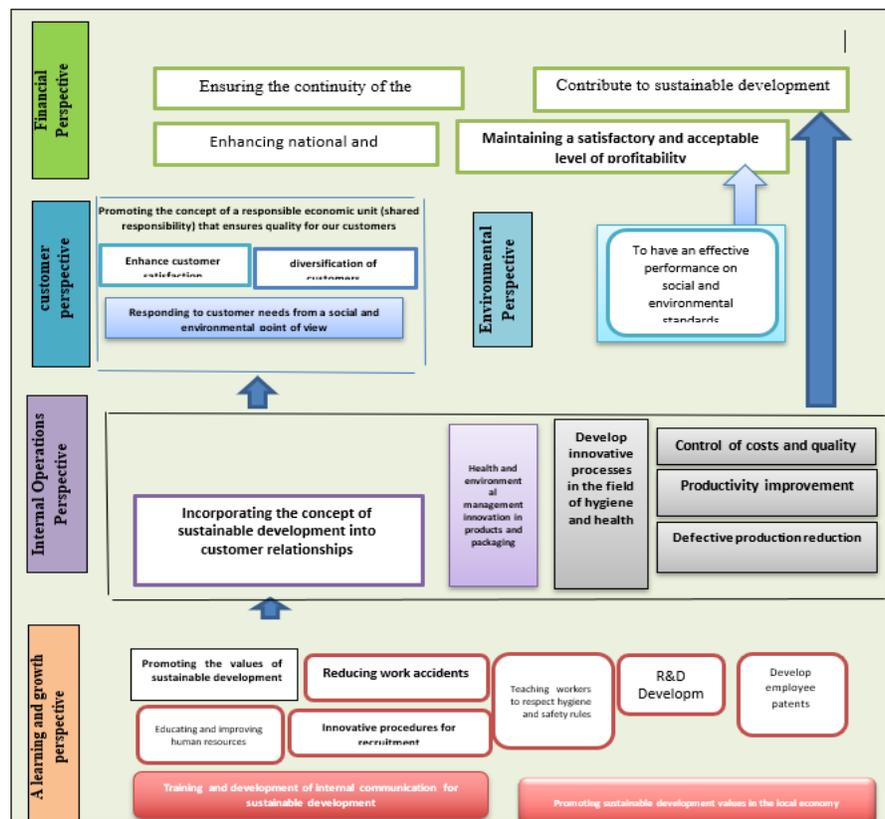
1. Personnel skills are developed to perform multiple tasks through supporting activities such as equipment tasks, minor repairs, preventive maintenance, quality checking and operation of various machines and devices.
2. Manufacturing activities can be redesigned from batch production

career planning to JIT cellular manufacturing systems.

3. If manufacturing processes are redesigned, the time of the time cycle will be reduced if the time of the time cycle is reduced, the time of delivery to customers will be reduced, and the time of delivery will increase customer satisfaction.
4. If customer satisfaction increases, market share increases if market share increases, sales revenue increases, if sales revenue increases, profits increase.

The above shows that there is a clear relationship between sustainable balanced labeling and cause-and-effect analysis, as learning, growth, internal processes and clients have a direct and positive impact on the financial side , The latter dimension (environmental and social) has an impact on all dimensions, as the addition of the environmental and social dimension plays an important role in improving and developing the balanced tag and raises the quality of SBSC. The addition of environmental measures helps to link environmental objectives to the strategy of economic unity.

Figure (1): Relationship between cause-effect analysis and Sustainable Balanced Scorecard.



Source: Gérald NaroK, "Les indicateurs sociaux: Du contrôle de gestion sociale aux développements récents du pilotage et du reporting", Institut des Sciences de l'Entreprise et du Management, Université Montpellier I. le: 02 /04/2010 http://pedagogie.ac-montpellier.fr/Disciplines/eco_gestion/ consulter. P. 21
<https://en.calameo.com/read/004556811c782aa12d70b>

SIXTH: PLACE OF RESEARCH AND APPLICATION PROCEDURES

Wasit weaving and knitting factory was selected in 1971 was selected by merging textile and sewing processors to engage them with a single engineering service, adjacent to the site and similar to their final production , It was named for Wasit State Textile Industries in 2001. On 1 jan 2016, the company was converted into a textile factory and merged with other textile companies. The State Company for Textile and Leather Industries was founded. A textile and weaving plant is located in the province of Wasit, Kut City, on the left bank of the Tigris River.

The identification of the economic unit strategy is the starting point of the sustainable balanced tag project to enable it to be translated into a set of indicators to measure the performance of the economic unit and to determine the degree to which the economic unit has reached its objectives. The strategy of economic unity and the

building of the organizational structure contributes to the establishment of the basic objectives of a fabric and weaving plant in wasit .

1. Increase product quality.
2. Customer satisfaction.
3. Increase profits and reduce costs.

The SBSC weights were determined in agreement with the senior management of the fabric and weaving plant in wasit for each of the dimensions indicators for the Sustainable Balanced Tag. The importance of each of the five dimensions after the presentation of the concept is highlighted as a proposed alternative model and a modern tool for measuring and evaluating the performance of the plant and thus allowing for effective surveillance. The importance was determined and divided by the dimensions of the card by weighing based on the strategic objectives of the Economic Unit. There is no tool to measure or evaluate performance or even to monitor the functioning of a textile, weaving in wasit plant, if any, in the traditional methods

adopted. The weight and importance of each dimension will be determined in proportion to the factory's strategy and objectives and divided by the underlying indicators.

As previously stated in the theoretical part of figure (1), which shows the relationship between cause and effect with the sustainable balanced tag, There is an integrative relationship between the five

dimensions of the sustainable balance tag and each other from the bottom up, that is, when targets and indicators are set in a dimension that directly affects the other four dimensions. The development of these benchmarks and indicators in the tag should determine the ultimate strategic objective and how to achieve it through the five dimensions to be addressed in the table (3)

Table (3): SBSC weights

	The dimension	the description	Total weight	weight the index
1	Financial	This dimension is the primary objective for senior management and staff, as the continuous improvement of asset turnover and return on investment is indicative of the success, continuity and evolution of the economic unit.	20%	<ul style="list-style-type: none"> ● Turnover of assets 10% ● Rate of return on invested capital 5% ● Cost Reduction and Productivity Improvement Index 5%
2	customer	The consumer is the main objective of economic unity activity and represents the market where its products are promoted and its benefits realized.	50%	<ul style="list-style-type: none"> ● Market share index 18% ● Customer retention index 20% ● Marketing cost index 12%
3	internal operations	<p>This dimension is sustainable and supportive of the customer and financial dimensions by creating value for customers and identifying productive processes and innovation processes in response to customer needs and assistance.</p> <p>The process of innovation is linked to the development and development of some organizational and technical aspects of the plant. The introduction of a new commodity or entry into a new market is an innovative objective.</p>	10%	<ul style="list-style-type: none"> ● Stock turnover 4% ● Daily performance rate of factor 3% ● Productivity improvement 3%

4	learning and growth	For this dimension, the economic unit has become concerned with the human component and in order to increase their ability to keep pace with the technical and technological development of the plant's activity.	10%	<ul style="list-style-type: none"> ● Framing Rate 3% ● Employment rates 3% ● Employee satisfaction rate 4%
5	environmental and social	There are some very few social contributions by contributing to the financing of some scientific and professional forums. On the environmental side, the economic unit believes that its relationship with the environment must be improvement the part of the flawed production is recycled and part is exported. The defective portion of unusable products is thrown into nature or burned, causing environmental damage.	10%	<ul style="list-style-type: none"> ● Water consumption rate 3% ● Electricity consumption rate 3% ● Production waste release rate 2% ● Social contribution 2%

Source: Preparation of the researcher based on a personal interview with the account manager

Accordingly, the proposed model of the sustainable balanced labeling card for a fabric and weaving plant is shown in table(3)

$$\text{The final result} = \frac{\text{Actual output}}{\text{Target}} \times \text{the weight}$$

This relationship is used in the event that the target has an upward effect on the activity of the economic unit, for example, the higher the turnover of the stock, the better the good the manufacturer, and the less it is an indication of a deviation to be addressed. If the objective has a downward effect, the lower the value already achieved, the more desirable and required and the higher the deviation that must be addressed by the economic unit. Maintenance costs are among the measures that have a downward effect on the production process. It is clear from the above that the final results of all indicators have been determined, after which the final results of each perspective have been calculated, and 4 years have been set for the study of this model and its applicability.

Table (4) Proposed model of Sustainable Balanced Scorecard

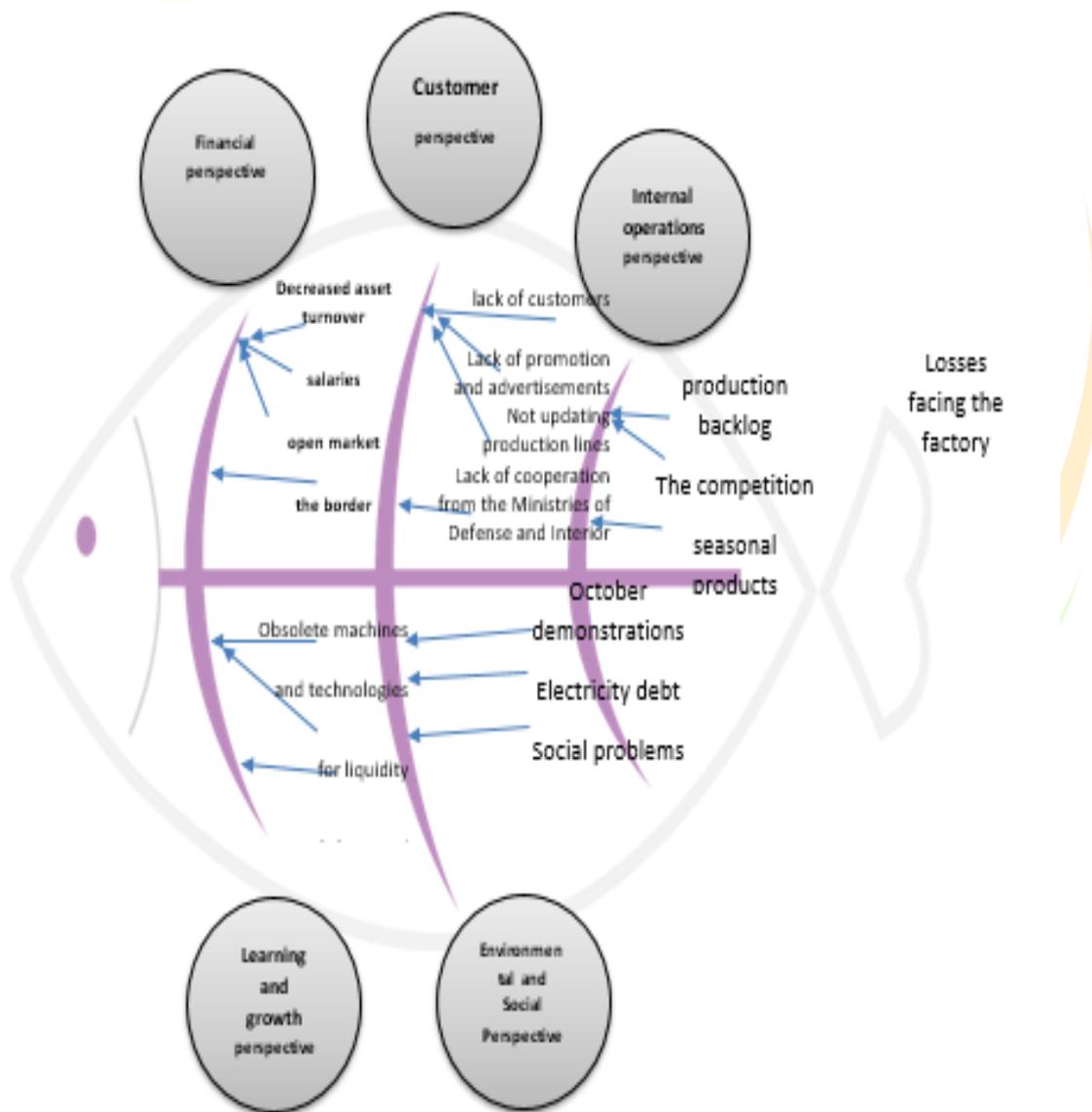
The final result				Actual results				Target	weight	Indications	Dimensions
2019	2018	2017	2016	2019	2018	2017	2016				
0.01911	0.02106	0.02283	/	0.1147%	0.1264%	0.137%	0.19%	60%	10%	Asset turnover	financial perspective
0.12721	0.12720	0.13816	/	1.5265%	1.5677%	1.658%	1.1893%	60%	5%	The rate of return on invested capital	
0.0974	0.16666	0.01473	/	1.169%	1.99997%	0.1768%	/	60%	5%	Reduce costs and improve productivity	
0.24372	0.31492	0.17572	/						20%	Performance of the financial perspective	
0.21444	0.33747	0.15429	/	0.7148%	1.1249%	0.5143%	/	60%	18%	market share	Customer perspective
8.6700	6.6455	8.7601	/	26.0102%	19.9367%	26.2803%	/	60%	20%	The degree of customer retention	
13.6842	(15.2564)	6.8728	/	68.421%	(76.282%)	34.364%	/	60%	12%	Marketing costs	
22.56864	(8.27343)	15.78719	/						50%	customer perspective performance	
0.00000176	0.00000267	0.0000558	/	0.0000287%	0.0000435%	0.0009068%	0.0019111%	65%	4%	Inventory turnover	perspective of internal operations
16,795.268	66.5022	1,681.758	/	363897.475%	1440.882%	36438.107%	2717.597%	65%	3%	Average daily performance of the worker	
4.12412	3.26326	(3.24964)	/	89.356%	70.704%	(70.409%)	/	65%	3%	Productivity improvement	
16,799.39212	69.76546267	1,678.508416	/						10%	Internal Operations	perspective

											Performance	
5.45456	5.45456	5.45456	/	100%	100%	100%	100%	55%	3%	framing rate	The perspective of learning and growth	
1.87358	(1.87745)	0.8529	/	45.349%	(34.420%)	15.636%	/	55%	3%	Employment rates		
(0.13956)	(0.34247)	(0.82051)	/	(1.919%)	4.709%	(11.282%)	/	55%	4%	Employee satisfaction rate		
7.18858	3.23464	5.48695	/							10%	Performance of the learning and growth perspective	
(0.501862)	0	0	/	(13.383%)	0	0	/	80%	3%	water consumption rate	The perspective 1 and social dimension	
0.375	0.073725	2.47736	/	10%	1.966%	6.063%	/	80%	3%	Electricity consumption rate		
4.2835	2.5753	1.187025	/	171.34%	103.012%	47.481%	/	80%	2%	Production waste disposal rate		
2.49725	2.49725	2.49725	/	99.89%	99.89%	99.89%	99.89%	80%	2%	social contribution		
7.15575	5.146275	6.161635	/							10%	The performance of the environmental and social perspective	
16,836.548	70.18968	1,706.119911	/							100%	overall performance	
Source: Preparation of the researcher												

After the sustainable balance tag of the texture and weaving plant has been designed as part of the proposed model, the problems facing the texture and weaving plant will be clarified

through the cause-and-result scheme (fishbone) and as in the figure below.

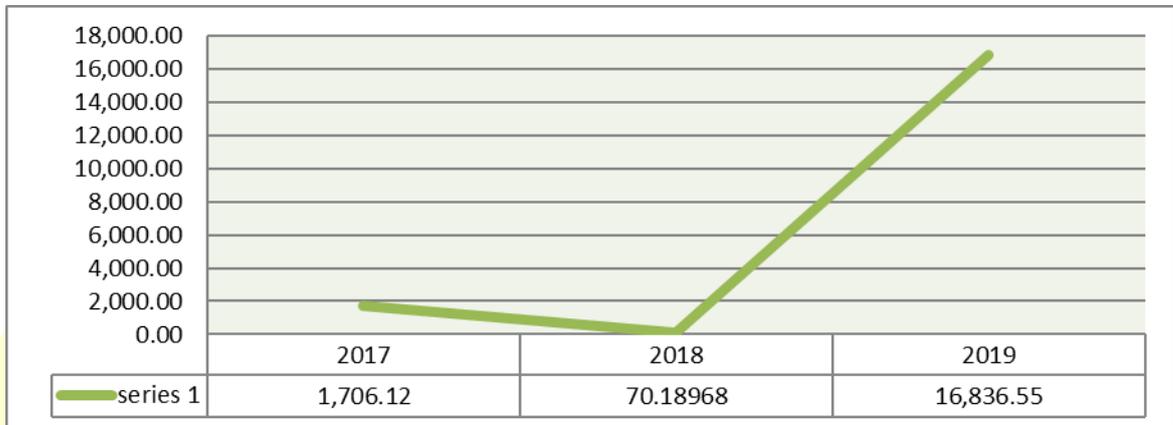
Figure 2: Reason and Result Analysis Scheme to Identify the Problems of a Textile, Sewing and Wasit Plant



Source: Searcher Setup

After the problems in the above figure have been identified and clarified, they will be represented graphically in figure No. (2)

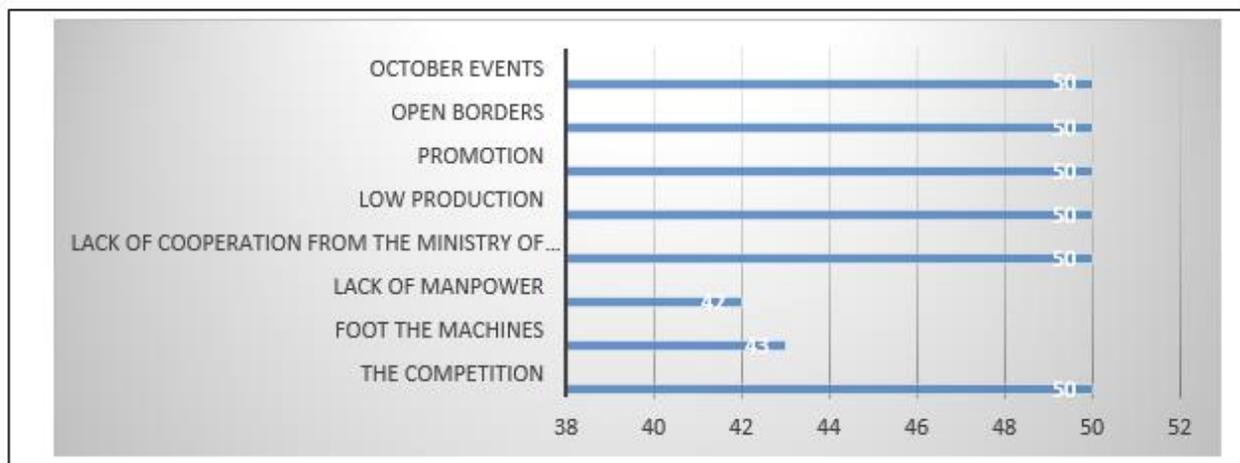
Figure 3: Graphic Representation of Total Performance of Fabric and Weaving Plant by SBSC Card



Source: Searcher Setup

The diagram of the cause-and-effect analysis is as follows:

Figure 3: Graphic representation of plant problems by cause-and-result analysis scheme



Source: Searcher Setup

At the conclusion of the practical aspect of the research, it is clear that if the proposed model is implemented to integrate the analysis of cause and effect and the

sustainable balanced label for the implementation of cost management strategies, many positive physical, societal and environmental benefits of economic

unity will be realized, These include reducing product costs, increasing product quality, contributing to customer confidence, and preserving the environment from pollution, which validates the research hypothesis that

“ Possible model proposal for application of cause-and-effect analysis and sustainable balance tag for implementation of cost management strategies in Iraqi industrial economic units”

To complement the requirements of this study, a number of conclusions will be drawn from the research.

SEVENTH: CONCLUSIONS

The main conclusions reached were divided into two parts: The first was concerned with the conclusions of the theoretical aspect, while the second was concerned with the conclusions of the practical aspect of the research, and my agencies:

1. The analysis of cause-and-effect technology in particular is one of the tools of quality management and helps greatly to solve the major problems facing economic units and thus to reach root causes, whether they are personal problems or at the working level, for the purpose of finding solutions.

2. The cause-and-effect relationship is not just a link, but a reasonable relationship between the level of the activity and its costs. It is crucial, because it gives analysts and managers confidence in the relationships that are frequently estimated in other sets of data, The identification of cost guides also gives managers a vision of several methods they use to reduce costs and the amount of routers.
3. The Sustainable Balanced Performance Card will create all operational activities in agreement with the long-term strategic vision of the Economic Unit, In order for the previous five dimensions to be balanced and integrated, it was necessary for the company to take into account environmental and social changes and how they were managed through a number of indicators.
4. The possibility of applying the proposed model to the company in question and clarifying the reduced returns and costs resulting from its application, by demonstrating the application of the proposed model in a textile and weaving plant in wasit for economic returns to the company as well as the environmental and social benefits derived from its application.

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