



## STUDYING THE POSSIBILITY OF APPLYING SIX SIGMA STRATEGY TO INCREASE PERFORMANCE EFFICIENCY AND QUALITY OF HEALTH SECTOR SERVICES

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<p><b>Received:</b> 30<sup>th</sup> January 2022 <b>Accepted:</b> 28<sup>th</sup> February 2022 <b>Published:</b> 8<sup>th</sup> April 2022</p>	<p>The Six Sigma strategy is one of the modern tools of managerial accounting, through which quality is measured in relation to the employee's environmental status at work and the quality of service delivery efficiency for the customer. Most government service institutions use the old traditional form of management accounting, traditional forms do not serve the employee's situation and greatly affects the provision of service to the customer, leading most institutes into being incapable of performing their service functions, in terms of providing service, sustainability, and quality improvement. The local beneficiaries are constantly expressing their dissatisfaction with the poor services and the lack of progress and performance in the institution.</p> <p>Therefore, the researchers in this research studied the extent to which using modern management system (the Six Sigma strategy) can be applied to the health sector institutions in Baghdad and what are the obstacles that limit the interest from two perspectives, both Medical personnel and Medical patients had responded to the questioner to achieve a high degree of quality in the performance of the institution and more generalized results. The researchers concluded various results the most important of which is that using six sigma strategy can be achieved in the health sector institutes.</p>

**Keywords:** Accountability, Six sigma, Quality improvement, Management accounting, Quality control systems.

### INTRODUCTION

#### Problem statement

Through the exploratory field visit to some Baghdad governmental hospitals, it was found that there is no interest in modern quality requirements and quality control systems, whether the quality of services provided by the employees or the services provided in general. These issues arises due to the dependency on traditional management systems leading to increased deaths in the hospitals, thus reflecting negatively on both Medical personnel and Medical patients. On this basis, the problem lies in the following question:

Is it possible to apply six sigma in hospitals in Baghdad in order to improve quality?

#### Study hypothesis

Governmental hospitals do not apply modern methods of quality for management accounting to increase the efficiency of performance of the hospital by

servicing both Medical personnel and Medical patients using the six sigma quality measurement tool, despite the presence of application requirements in these hospitals.

#### Purpose of the study

Knowing the extent to which modern quality methods of managerial accounting are applied in government service institutions (the health sector) in Baghdad using the six sigma strategy to measure the quality of performance.

#### Significance of the study

The importance of the study appears when applying the six sigma method, which in turn will be reflected in improving the health performance of the hospitals under study, and then this leads to improving the performance of Medical personnel, which improves the service provided to the patient, which should be the main objective of these hospitals.



### **The study sample**

The study sample includes the government health sector in Baghdad, and we will deliberately take here both Kadhimiya and Yarmouk hospitals as a sample for government hospitals, where the method used in collecting information was the questionnaire method, where (88) questionnaires were distributed to Medical personnel and (69) forms to study the Medical patients perspective.

### **Literature review**

The progress of management accounting has led to an increase in the intensity of competition between service institutions in particular in terms of support, planning, guidance and control for the employee, and thus providing high-quality service to the beneficiary. The performance of the institution (Seddik, 2014).

The most modern methods are based on survival and growth for the better, so indicators and metrics are often used to improve the performance situation. After the performance standard indicators were concerned only with financial matters such as measuring financial balance, liquidity, financial ease and profitability, now its goal is to achieve long-term profits and that By using modern methods, namely measuring the quality and competitive advantage of the institution (Miloud, 2015).

This modern measurement is carried out through several methods: (benchmarking, total quality management, 6 sigma, continuous improvement, management and accounting of activities, customer profitability analysis, target costs and product life cycle costs, and the balanced scorecard). (Arab Administrative Development Organization, 2018).

1. Activity-based costing system: It is a system concerned with achieving a fair allocation of scarce resources available to activities as an intermediate axis, and then reallocating additional (indirect) costs through cost drivers to products as a final cost axis.
2. Target cost system: It is the estimated long-term cost of the product (good or service), which if sold would enable the company to achieve the target income.
3. Customer profitability analysis: It is the process of allocating revenues and costs to customer segments or individual customer accounts so that the profitability of those sectors or accounts can be easily calculated and then focus on the most profitable customers.
4. Balanced Scorecard: Translating the mission and strategy of the organization into tangible goals and measures through the interaction of four axes: the financial axis, the customer's axis, the internal operations axis, and the growth and learning axis.
5. Six sigma strategy for measuring quality: Six sigma, which is one of the tools for measuring the quality of performance of the organization, is one of the most

famous management concepts in the world of total quality management. As major international companies began to adopt and apply it to their administrative procedures, and it was widely and differently spread, the idea of sigma 6 lies in that if the facility is able to measure the number of defects present in a process, it can scientifically remove those defects and approach the point of being free from defects (Zoelf, 2012).

It is also a strategy to improve quality by reducing costs and improving and developing processes, and its application results in a decrease in the percentage of defects to 3.4 per million opportunities for defects to occur. This concept is considered one of the modern administrative concepts. At the beginning of the twentieth century, managers entered with the (either ... or) mentality, either to choose to improve performance or by improving overall quality.

The link between six sigma and quality is a natural extension of quality efforts, and the 6 sigma mechanism works by linking the highest quality with the lowest costs, in addition to that 6 sigma quality management provides the tools and techniques necessary to bring about cultural changes and the development of processes within the department, and the first steps in calculating 6 sigma are to determine expectations and customer requirements, that Six Sigma is not about quality itself, but rather to provide better value to beneficiaries and employees.

The six sigma strategy is summarized as follows:

1. Focus on the beneficiaries.
2. Decisions are made on the basis of facts and accurate data.
3. Focus on operations.
4. Effective management based on advance planning.
5. Unlimited cooperation between members of the same institution in order to achieve the goals.
6. Continuous improvement using scientific tools at the lowest cost and highest benefit.
7. The full participation of every individual from the institution.
8. Prevention rather than inspection, which drains energies.

The Six Sigma system is based on basic criteria based on defining the procedures and then measuring their level, analyzing them, developing them and reaching the highest levels of quality control in the procedures. In addition, it requires the commitment of higher authorities, training, organizational culture and focus on the beneficiary. (Al-Zwyalif, 2012).

### **The means to measure Six Sigma**

An error or defect is any deviation of the service or process from the requirements of the beneficiary. When we count the errors and defects in the service provided



to the customer, we can calculate the sigma level or the level of errors, which is equal to the number of errors in every million opportunities and is referred to in brief. The level or sigma rate in operations can be measured by following the steps The following (Al-Asiri, 2010, p. 145):

1. Starting with the customer: after the requirements of the beneficiary are accurately determined, what does not add value to the beneficiary can be considered a mistake that deserves correction.
2. Determining the meaning of deviation (sigma): It announces errors that have been discovered without covering up or taking into account the feelings of any employee or favoritism to any party.
3. A numerical target is set to eliminate errors.
4. The errors to be eliminated are identified quantitatively and qualitatively, and the desired level is known. Only in this way can the performance culture in the organization be changed.

As for performance efficiency, institutional performance is the basis for evaluating the organization's progress and achieving its goals, identifying its strengths and weaknesses, in addition to deciding its future and developing initiatives aimed at clarifying how to start improving this performance. Performance is the main driver for improving the quality of services in the absence or use of inappropriate means that can act as a barrier to change and may lead to deterioration. The Queensland government (2006) identified three reasons for measuring performance (Nyeko, 2019):

1. It provides feedback about the planned results that are being achieved in the organization.
2. It provides information for analysis and decision making.
3. It provides information to the executive management about effectiveness, efficiency and value.

As for its importance for hospitals in particular, setting specific and well-studied criteria for evaluating the activity of hospitals is very important in view of the large and increasing amount of public resources allocated to health care in order to discover and improve potential deficiencies, taking into account this goal and setting appropriate guidelines for efficient performance, Which serves the hospital administration, despite the fact that the funding is public, but there must be a private insurance company that manages health care, and this is done by public bidding (clement, 2010).

The researchers believe that the problem of government service institutions, especially the health sector, is a complex one. vehicle; Overlapping; It may consist of poor planning, poor management, loss of follow-up, lack of evaluation, large number of

employees, lack of doctors, neglect of basic duties, exploitation of the job, and no specifying the service or indicating the duration of its completion. Therefore, it is necessary for hospitals to rely on the personal and career development of the employees, because this development represents the cornerstone in the happiness of the employees and providing the best service to the patient, and then enhancing government performance and excellence in hospitals. Highlighting the joint work between the employee and the boss to set personal goals and align them with institutional goals, as the outstanding performance of the department stems from the performance of its employees, so that we can reach a culture that focuses on outstanding performance and achievement at all times, and follow the approach of guidance and counseling. The results of previous research indicated that the institutions that follow this methodology will enjoy better and higher performance and will also contribute to motivating workers and developing their performance, in addition to building an environment of positivity and communication between all employees of different administrative levels, and all this is ultimately in the interest of patients (Hamza, 2012).

### **Previous studies**

#### **1 . Study (Tan & others, 2019):**

The study proved that (six sigma) is an effective approach and strategy for business success in both the private and government sectors, as it helps in providing a roadmap, complete tools and comprehensive techniques to improve the business process. This research differs from the rest of the research in exploring whether this strategy is still one of the success factors It is one of the agents of leadership to maintain the continuity of success, and this was a case study for a company for 5 years, and the study was based on a quantitative basis, which is the important level for each success. A questionnaire was used, which was answered by 50 engineers and managers from the company and analyzed, and the conclusion was for this The study is that the success factors lie in (six sigma) because they are innovative factors based on communications and support for senior management, so the company should pay more attention to these factors because they are weak.

#### **2 . Study (Hamza, 2012):**

This study aimed to introduce the methods and techniques of modern strategic management accounting and its role in serving the goals of contemporary management. By collecting data from 7 Iraqi industrial companies for 45 individuals, the study concluded that many companies are moving towards



this modern strategy and its application in management and finance, and it has become necessary in all types of companies and for all sectors, and that the methods and techniques of strategic management accounting represent modern tools to meet the requirements of contemporary strategic management. and achieving corporate success.

### **3 . A study (Zorob, 2013):**

This study aims to try to shed light on the extent to which companies listed on the Palestine Exchange apply administrative accounting methods, whether traditional or modern, and the scope of their use, and to know which of those methods are the most common. To accomplish this, the researcher conducted a field study, using a list prepared specifically for this Purpose: (86) questionnaires were distributed, of which (63) were adopted for the purposes of analysis. It was found from the results of the study that the use of traditional management accounting methods by companies listed on the Palestine Stock Exchange is average. While the percentage of using modern administrative accounting methods was low, and that one of the most traditional administrative methods used is the actual cost method and the least used method is the discounted cash flow method and the capital budgets method, and one of the most modern methods followed is the activity-based cost method and the least used is the value-added method. The companies listed on the Palestine Exchange use management accounting methods in various fields to a moderate degree, including preparing financial statements, performance evaluation, and preparing budgets. And that one of the reasons for the lack of widespread use of administrative accounting methods, especially modern ones, is the high cost of application, poor knowledge of these methods, lack of awareness of the importance of modern methods, and the lack of conviction of the senior management of their importance. The researcher presented a set of recommendations and suggestions, the most important of which are: providing the necessary facilities that would contribute to the development and refinement of knowledge of administrative accounting methods and their fields of application, working to develop awareness, desire and ability to use them, working to activate its role as an information system, and raising awareness among corporate management Listed on the Stock Exchange, the importance of attracting competencies in the fields of cost accounting and modern management.

### **4 . Study (Al-Asiri, 2010):**

The study aimed to develop the proposed scenario for the application of Six Sigma method in managing the global environmental program in the Kingdom of Saudi

Arabia. The study used the descriptive survey method. The questionnaire was also adopted as a tool for collecting information. The study members consisted of (101) people, all of which were educational supervisors and teachers working in the global environmental program in the Kingdom of Saudi Arabia. The study reached a set of results, namely, that the Globe program management is ready to support the various programs of the Six Sigma method, in addition to the financial ability to use the Six Sigma method, providing facilities for using this method, developing workers and providing qualified trainers to train workers through direct contact with global experts, and it also presented a proposal and an approach. Special for everything related to the Sigma program.

### **5 . Study (Al-Taie, 2015):**

This research dealt with the process of reducing costs through some strategic methods of managerial accounting, target costing, disjointed analysis and kaizen. By focusing on cost-reduction decisions, through the use of some strategic management accounting methods, and in this way, the research was able to prove the hypothesis that "the strategic methods of managerial accounting (target cost, disjointed analysis, continuous improvement, and quality costs) when applied by the management of the economic unit lead To make decisions related to cost reduction and quality achievement". In light of this, a set of conclusions was reached, the most important of which is the company's reliance on traditional methods in calculating the costs of products, and then the lack of causal relationship between the bases used in distribution and the cost centers that cause the cost, and the most important recommendations are the need for economic units to rely on modern administrative methods to improve Production processes because of their significant and prominent role in enhancing the competitive capabilities of these units in the face of the current rapidly changing environment and what is reflected in the achievement of the unit's goals of survival, growth and continuity in providing products with low prices and high quality.

### **6 . Study (obazee & others, 2019):**

This study aimed to know the extent of the impact of stakeholders on management accounting activities to assess their level. Data were collected through a questionnaire, where the selected sample was 131 samples. Senior financial officials in charge of strategic and financial control in the main sectors of the Nigerian economy were used. Descriptive statistics and analysis of variance were used. Where the results showed that the general level of influence that stakeholders exercised on management accounting activities is



moderate and is linked to strategy variables such as competitors and customers, but according to the business plan of any company that wants to survive, it must focus on modern management accounting techniques that focus on customers and competitors, customer tastes and morale. The market is externally oriented, the organization may have to create jobs that take responsibility for the company's business plan through continuous environmental survey, information gathering and market research.

#### **7 . Study (Deshmukh & other, 2019):**

This study aimed to verify the feasibility of using six sigma in the health services sector (hospitals), where the problem lies in the distortion of the sector and the many defects and gaps in it, which thus leads to a big difference between life and death, in reducing unfortunate accidents and increasing hospital visits by patients, Where this research made a great effort to reduce the variation in service quality using six sigma, and the results of this research were that the DMAIC tool was found to improve service quality in service sectors such as hospitals, banks and restaurants.

#### **8 . Study (Sheikh, 2015):**

This study aimed to show the extent of the intensity of competition between all companies at various levels, as it became necessary for each company to work on continuing to improve its performance in order to be able to face that competition and stay in the market by using the modern management accounting system, and this is what companies need. In Jordan, especially after Jordan entered the field of a free economy, the management system based on activities and the budgeting system prepared on the basis of activities were chosen as tools for the continuous improvement and development of the performance of the Jordanian public shareholding industrial companies listed on the Amman Financial Market (Amman Stock Exchange). The most important findings of the study were that the Jordanian public shareholding industrial companies possess the basic ingredients needed to implement both activity-based budgeting and management systems, and they also have systems that help implement activity-based budgeting and management systems. However, it does not have a staff with sufficient knowledge of the activities-based budgeting and management systems, and most of the Jordanian public shareholding industrial companies' managements were convinced of the advantages of the activity-based management system.

### **RESEARCH METHODOLOGY**

This part reviews the methodology, population and sample of the study, methods of data collection, and methods of analysis as follows:

#### **• Study Approach:**

There are a set of basic approaches in the humanities to search for and study a problem, including the descriptive-analytical approach. In this study, the researchers used the descriptive analytical method, as well as the descriptive statistical method for tabulating and analyzing the data and information obtained through the field application of the study tool and the use of the questionnaire tool for data collection and analysis.

#### **• Study community:**

This research aims to find out the extent to which modern quality management accounting methods are applied in government service institutions (the health sector) in Baghdad using the six sigma strategy to measure the quality of performance and thus its negative impact on Medical personnel and Medical patients. Therefore, the questionnaire will be divided into two axes, one for Medical personnel and Medical patients. The sample randomly located in two of the most important and oldest governmental hospitals in Baghdad, namely Yarmouk Governmental Hospital and Al-Kadhimiya Governmental Hospital, will be studied.

#### **• Study tool:**

The researchers relied on collecting data through the questionnaire tool to study the research problem, divided into two samples, the first of which aims to study the viewpoint of Medical personnel, and the second sample aims to study the viewpoint of Medical patients in government hospitals. The questionnaire consists of two main axes, the first axis measures the severity of the response of the two samples, so 15 questions were set to measure the severity of the answers for Medical personnel and 21 questions aimed at measuring the severity of the answers for Medical patients. The second axis aims to make descriptive statistics for the two target samples in the research, as 15 questions were set for a sample of Medical personnel and 21 questions for a sample of patients in the hospital. It is worth noting that the five-point Likert scale will be used to measure the severity of the answer and to analyze the results of the study using the SPSS statistical program. A number of (88) questionnaires were distributed to Medical personnel, and they were valid for analysis, including (87) questionnaires, and the retrieval rate was (99%), and (69) questionnaires were distributed dedicated to studying the Medical patients point of view, and (61) questionnaires were valid for analysis. The return rate is 92%.



**• Questionnaire Fit**

The researchers presented the questionnaire to a number of accounting specialists to ensure the clarity of the paragraphs and the integrity of the language. The amendments were made in the light of the arbitrators, as the researchers benefited from the amendments that were made to the questionnaire form in order to increase the integrity of the tool and to ensure that appropriate answers were obtained from the research sample that answers the questions posed and thus the research problem.

**RESULTS AND ANALYSIS**

**First: Analyzing the personal data of the research sample**

**• Age distribution is the focus of medical personnel**

As shown in Table No. (1) that the age group (18-29) was the highest, reaching 59% of the respondents, and the age group (30-39) came in second place, and the percentage was 29%, and the last two categories were (40-49) and (50 and more) were respectively 3%, which is the lowest participation rate, and the latter is 9%.

**Table No. 1 Age Distribution Of Medical Personnel**

N	Age	Redundancy	Percentage
1	18-29	51	59%
2	30-39	25	29%
3	40-49	3	3%
4	50-more	8	9%

**• Age distribution is the focus of Medical patients**

The age group of patients participating in the questionnaire was a high percentage for the two age groups (18-29) by 62% and (30-39) and by 34%, and the remaining two age groups constituted the same percentage, which is 2% for each of (40-49). As well as (50 or more), as is clear in Table No. (2).

**Table No. 2 Age Distribution Of Medical Patients**

N	Age	Redundancy	Percentage
1	18-29	38	62%
2	30-39	21	34%
3	40-49	1	2%
4	50-more	1	2%

**• Gender distribution for Medical patient's axis**

As shown in Table No. (3), the percentage of females was higher in the response than males, and constituted 57% of the females, whereas the males constituted 43% of the respondents.

**Table No. 3 Gender Distribution Of Respondents**

<b>Medical Patients</b>			
N	Gender	Redundancy	Percentage
1	Male	26	43%
2	Female	35	57%
<b>Medical Personnel</b>			
N	Gender	Redundancy	Percentage
1	Male	48	55%
2	Female	39	45%



**Second: response severity analysis**

**• Measuring the severity of the response for Medical personnel**

**Table No. 4 Descriptive Statistics For Medical Personnel**

N	Question	Highly agree		Agree		Neutral		Disagree		Highly Disagree	
		R	P	R	P	R	P	R	P	R	P
1	The hospital is concerned with staff training and development	16	18 %	7	8%	12	14 %	27	31 %	25	29 %
2	The hospital provides material and moral support to a good employee after measuring performance	4	5 %	1	1%	15	17 %	46	53 %	24	21 %
3	Recruiting employees is one of the hospital's priorities	7	8 %	3	3%	7	8%	25	29 %	45	52 %
4	Hospital administration pay attention to the staff's uniform status	12	14 %	5	6%	20	23 %	34	39 %	16	18 %
5	Medical insurance include all working staff	5	6 %	2	2%	12	14 %	27	31 %	41	47 %
6	There is an effective communication between employees and administration	16	18 %	4	5%	37	42 %	17	20 %	13	15 %
7	Staff opinions and suggestion are taken into consideration by the administration	10	12 %	3	3%	33	38 %	17	20 %	24	27 %
8	There is motivation towards employee of the month culture	7	8 %	5	6%	24	28 %	29	33 %	22	25 %
9	Administrators encourage effective communication abilities among personnel and administrators	11	13 %	1	1%	29	33 %	20	23 %	26	30 %
10	Administrators focus on continuing guidance and counseling	13	15 %	4	5%	35	40 %	21	24 %	14	16 %
11	Administrators focus on employee development	6	7 %	3	3%	18	21 %	27	31 %	33	38 %
12	Administrators focus on employee individual performance	7	8 %	3	3%	31	36 %	26	30 %	20	23 %
13	Administrators focus on teamwork among personnel	14	16 %	4	5%	34	39 %	18	21 %	17	19 %
14	Administrators focus on continuous personnel education and training	9	10 %	6	7%	29	33 %	21	24 %	22	25 %
15	Administrators rewards high performance with remunerations	3	3 %	2	2%	13	15 %	34	29 %	35	40 %

As shown in Table No. (4), all the answers were generally in the direction of (neutral\_and do not agree), except for questions No. (3,5,15,11) that were in the direction of (I strongly disagree).

**• Measuring the severity of the Medical patients response**

It is clear from Table (5) that the respondents' answers on this axis tended in general towards (neutral and do not agree) with the exception of some questions, including (8,9,10,20).

**Table No. 5 Descriptive Statistics For Medical Patients**

N	Question	Highly agree		Agree		Neutral		Disagree		Highly Disagree	
		R	P	R	P	R	P	R	P	R	P
1	Long queue waiting time	23	38 %	11	18 %	22	36 %	2	3%	3	5%



2	Special needs services are considered by administrators	6	10 %	2	3%	18	30 %	18	30 %	17	27 %
3	There is a high level of patient care by the doctors	11	18 %	6	10 %	24	39 %	15	25 %	5	8%
4	There is a permanence from the doctor to the patient	4	7 %	6	10 %	25	41 %	11	18 %	15	24 %
5	The hospital administration is meticulously interested in recording information about patients in the records	17	28 %	2	3%	16	26 %	14	23 %	12	20 %
6	The hospital administration is meticulously interested in recording information about patients on the computer	10	16 %	5	9%	13	21 %	16	26 %	17	28 %
7	The hospital needs to update the medical supplies currently in use	45	74 %	15	25 %	1	1%	0	0%	0	0%
8	The hospital needs to upgrade the patient halls and lobbies	25	41 %	34	56 %	2	3%	0	0%	0	0%
9	The hospital needs to update the equipment and equipment currently in use	46	67 %	13	22 %	1	1%	0	0%	1	1%
10	The hospital needs to update the waiting areas	34	71 %	10	16 %	3	5%	1	1%	4	7%
11	Neglecting hospital hygiene	13	21 %	20	33 %	19	31 %	5	8%	4	7%
12	The hospital is interested in providing services to the patient	8	13 %	3	5%	25	41 %	14	23 %	11	18 %
13	The hospital administration provided the material supplies as much as possible within the available possibilities and appropriate to your expectations	6	10 %	1	1%	18	30 %	15	25 %	21	34 %
14	The hospital administration sympathizes with patients when they submit complaints	4	7 %	5	8%	20	33 %	17	28 %	15	24 %
15	The hospital administration is interested in providing the service on time	5	8 %	4	7%	21	34 %	16	26 %	15	25 %
16	The hospital administration is interested in providing the service quickly and accurately	5	8 %	1	1%	20	23 %	16	37 %	19	31 %
17	Patients place their trust and safety in the skills of the medical profession	12	20 %	6	10 %	25	40 %	12	20 %	6	10 %
18	The medical staff interacts with patients, is kind and courteous	10	16 %	4	7%	27	45 %	10	16 %	10	16 %
19	The hospital provides all kinds of medicines free of charge	7	12 %	3	5%	23	38 %	13	20 %	15	25 %
20	Difficulty in booking appointments for patients	24	39 %	11	18 %	15	25 %	7	12 %	4	6%
21	I would like to go back for treatment again when I need this hospital	6	10 %	5	8%	17	28 %	15	25 %	18	29 %

**Third: descriptive statistics**  
 • **Descriptive statistics for the Medical personnel axis**

Table No. (6) shows that Question No. 2, which states, "The hospital provides material and moral support to the good employee after measuring his performance"





obtained the lowest standard deviation, and Question No. (6), which states, "There is effective communication between the staff and their managers," got the highest mean of the calculation. This is what qualified question

number (6) to obtain the least coefficient of variation, and thus the first question was in terms of relative importance.

**Table No. 6 Descriptive Statistics For Medical Personnel**

N	Question	Arithmetic mean	standard deviation	Variation coefficient	Relative importance
1	The hospital is concerned with staff training and development	2.56	1.452	57%	13
2	The hospital provides material and moral support to a good employee after measuring performance	2.09	0.936	45%	3
3	Recruiting employees is one of the hospital's priorities	1.87	1.209	65%	15
4	Hospital administration pay attention to the staff's uniform status	2.57	1.254	48.8%	6
5	Medical insurance include all working staff	1.89	1.104	58%	14
6	There is an effective communication between employees and administration	2.92	1.260	43%	1
7	Staff opinions and suggestion are taken into consideration by the administration	2.52	1.256	50%	9
8	There is motivation towards employee of the month culture	2.38	1.164	48.9%	7
9	Administrators encourage effective communication abilities among personnel and administrators	2.44	1.282	53%	11
10	Administrators focus on continuing guidance and counseling	2.78	1.224	44%	2
11	Administrators focus on employee development	2.10	1.162	55%	12
12	Administrators focus on employee individual performance	2.44	1.128	46.2%	4
13	Administrators focus on teamwork among personnel	2.77	1.282	46.3%	5
14	Administrators focus on continuous personnel education and training	2.53	1.237	49%	8
15	Administrators rewards high performance with remunerations	1.90	0.977	51%	10

**• Descriptive statistics for the Medical patients hub**

It is clear from Table No. (7) that Question No. 7, which states, "The hospital needs to update the medical supplies currently in use," obtained the highest arithmetic mean and the lowest standard deviation, and this is what qualified it to obtain the lowest coefficient of variation, and thus the first question was in terms of relative importance

**Table No. 7 Descriptive Statistics For Medical Patients**

N	Question	Arithmetic mean	standard deviation	Variation coefficient	Relative importance
1	Long queue waiting time	3.80	1.138	30%	5
2	Special needs services are considered by administrators	2.38	1.213	50.9%	17



3	There is a high level of patient care by the doctors	3.5	1.189	35.9%	8
4	There is a permanence from the doctor to the patient	2.56	1.162	45%	11
5	The hospital administration is meticulously interested in recording information about patients in the records	2.97	1.483	50%	16
6	The hospital administration is meticulously interested in recording information about patients on the computer	2.59	1.407	45.2%	20
7	The hospital needs to update the medical supplies currently in use	4.72	0.488	10%	1
8	The hospital needs to upgrade the patient halls and lobbies	4.38	0.533	12%	2
9	The hospital needs to update the equipment and equipment currently in use	4.69	0.672	14%	3
10	The hospital needs to update the waiting areas	4.43	1.117	25%	4
11	Neglecting hospital hygiene	3.45	1.119	32%	6
12	The hospital is interested in providing services to the patient	2.72	1.213	45%	12
13	The hospital administration provided the material supplies as much as possible within the available possibilities and appropriate to your expectations	2.28	1.240	45.3%	21
14	The hospital administration sympathizes with patients when they submit complaints	2.44	1.148	47%	13
15	The hospital administration is interested in providing the service on time	2.48	1.178	74.5%	14
16	The hospital administration is interested in providing the service quickly and accurately	2.30	1.174	51%	18
17	Patients place their trust and safety in the skills of the medical profession	3.10	1.221	39%	9
18	The medical staff interacts with patients, is kind and courteous	2.90	1.248	43%	10
19	The hospital provides all kinds of medicines free of charge	2.57	1.244	48%	15
20	Difficulty in booking appointments for patients	3.72	1.280	43%	7
21	I would like to go back for treatment again when I need this hospital	2.44	1.272	52%	19

**Fourth: measuring internal honesty**

Any statistical analytical process greatly needs to know the degree of validity and reliability scales, which through the two scales the researcher can verify the validity of his hypotheses and scientific conclusions, through which the researcher makes sure of the validity of his results that he concluded by carrying out the process of statistical analysis.

The internal consistency analysis (internal validity) is one of the statistical analyzes that aims to know the

scale degrees of the interrelated relationship between the paragraphs of the questionnaire in the scientific research, the higher the degree of internal consistency of the paragraphs, the greater the homogeneity of the test. This test depends on extracting Cronbach's alpha coefficient in the measurement, which gives an idea of the consistency of the questions among them, and its consistency with all questions in general, and judging the reliability in general is based on the amount of the



correlation coefficient that results from the statistical analysis process.

• **Measuring the internal honesty for Medical personnel axis**

From Table (8), it is clear that the correlation coefficients for each question and the total score of the axis questions are statistically high, and this indicates

that the axis questions are able to measure what was developed by a mechanism, and question No. 15 obtained the highest correlation coefficient of (512.0), in addition to that the questions No. (1, 7, 8, 12) did not obtain significant correlation coefficients, so it cannot be inferred from them

**Table No. 8 Correlation Coefficient For Medical Personnel**

N	Question	Correlation Coefficient
1	The hospital is concerned with staff training and development	0.107
2	The hospital provides material and moral support to a good employee after measuring performance	0.430**
3	Recruiting employees is one of the hospital's priorities	0.255*
4	Hospital administration pay attention to the staff's uniform status	0.277*
5	Medical insurance include all working staff	0.323**
6	There is an effective communication between employees and administration	0.229*
7	Staff opinions and suggestion are taken into consideration by the administration	0.167
8	There is motivation towards employee of the month culture	0.199
9	Administrators encourage effective communication abilities among personnel and administrators	0.315**
10	Administrators focus on continuing guidance and counseling	0.341**
11	Administrators focus on employee development	0.377**
12	Administrators focus on employee individual performance	0.168
13	Administrators focus on teamwork among personnel	0.315*
14	Administrators focus on continuous personnel education and training	0.238*
15	Administrators rewards high performance with remunerations	0.512**

• **Measuring the internal validity of the Medical patients**

From Table (9) it is clear that the correlation coefficients for each question and the total score for the axis questions are statistically high, and this indicates that the axis questions are able to measure what a

mechanism has been developed, and question No. 12 obtained the highest correlation coefficient of (791.0), in addition to that the questions No. (9, 12) did not obtain significant correlation coefficients, so it cannot be inferred from them

**Table No. 9 Correlation Coefficient For Medical Patients**

N	Question	Correlation Coefficient
1	Long queue waiting time	0.467**
2	Special needs services are considered by administrators	0.560**
3	There is a high level of patient care by the doctors	0.712**
4	There is a permanence from the doctor to the patient	0.659**
5	The hospital administration is meticulously interested in recording information about patients in the records	0.707**
6	The hospital administration is meticulously interested in recording information about patients on the computer	0.723**
7	The hospital needs to update the medical supplies currently in use	0.278*
8	The hospital needs to upgrade the patient halls and lobbies	0.545**



9	The hospital needs to update the equipment and equipment currently in use	0.025
10	The hospital needs to update the waiting areas	0.369**
11	Neglecting hospital hygiene	0.200
12	The hospital is interested in providing services to the patient	0.791**
13	The hospital administration provided the material supplies as much as possible within the available possibilities and appropriate to your expectations	0.624**
14	The hospital administration sympathizes with patients when they submit complaints	0.705**
15	The hospital administration is interested in providing the service on time	0.703**
16	The hospital administration is interested in providing the service quickly and accurately	0.769**
17	Patients place their trust and safety in the skills of the medical profession	0.578**
18	The medical staff interacts with patients, is kind and courteous	0.730**
19	The hospital provides all kinds of medicines free of charge	0.569**
20	Difficulty in booking appointments for patients	0.401**
21	I would like to go back for treatment again when I need this hospital	0.758**

**Fifthly: measuring stability**

The second measure in statistical analysis is the measure of reliability. The concept of general stability is "that the test performed by the researcher gives the same results if it is repeated on the same group and in the same circumstances at a later time."

**• Stability of Medical personnel axis**

• Table No. (10) shows that the reliability coefficient of the whole Cronbach alpha was 0.858, which is greater than the loaned reliability coefficient of 0.600, and that question No. 9 contributed more than others to the stability of the axis questions

**Table No. 10 Stability Coefficient For Medical Personnel**

N	Question	Correlation Coefficient
1	The hospital is concerned with staff training and development	0.855
2	The hospital provides material and moral support to a good employee after measuring performance	0.852
3	Recruiting employees is one of the hospital's priorities	0.850
4	Hospital administration pay attention to the staff's uniform status	0.848
5	Medical insurance include all working staff	0.856
6	There is an effective communication between employees and administration	0.846
7	Staff opinions and suggestion are taken into consideration by the administration	0.852
8	There is motivation towards employee of the month culture	0.847
9	Administrators encourage effective communication abilities among personnel and administrators	0.841
10	Administrators focus on continuing guidance and counseling	0.844
11	Administrators focus on employee development	0.843
12	Administrators focus on employee individual performance	0.859
13	Administrators focus on teamwork among personnel	0.843
14	Administrators focus on continuous personnel education and training	0.848
15	Administrators rewards high performance with remunerations	0.852
	total	0.858



• **Stability measurement of Medical patients**

Table No. (11) shows that the reliability coefficient of the whole Cronbach alpha was 0.781, which is greater

than the loaned reliability coefficient of 0.600, and that question No. 12 contributed more than others to the stability of the axis questions

**Table No. 11 Stability Coefficient For Medical Patients**

N	Question	Correlation Coefficient
1	Long queue waiting time	0.828
2	Special needs services are considered by administrators	0.763
3	There is a high level of patient care by the doctors	0.752
4	There is a permanence from the doctor to the patient	0.756
5	The hospital administration is meticulously interested in recording information about patients in the records	0.749
6	The hospital administration is meticulously interested in recording information about patients on the computer	0.748
7	The hospital needs to update the medical supplies currently in use	0.792
8	The hospital needs to upgrade the patient halls and lobbies	0.770
9	The hospital needs to update the equipment and equipment currently in use	0.787
10	The hospital needs to update the waiting areas	0.816
11	Neglecting hospital hygiene	0.807
12	The hospital is interested in providing services to the patient	0.744
13	The hospital administration provided the material supplies as much as possible within the available possibilities and appropriate to your expectations	0.757
14	The hospital administration sympathizes with patients when they submit complaints	0.752
15	The hospital administration is interested in providing the service on time	0.750
16	The hospital administration is interested in providing the service quickly and accurately	0.747
17	Patients place their trust and safety in the skills of the medical profession	0.760
18	The medical staff interacts with patients, is kind and courteous	0.750
19	The hospital provides all kinds of medicines free of charge	0.761
20	Difficulty in booking appointments for patients	0.824
21	I would like to go back for treatment again when I need this hospital	0.747
	total	0.781

**CONCLUSIONS AND RECOMMENDATIONS**

**CONCLUSION**

This research aims to measure the quality in relation to the environmental status of the employee at work and the quality-of-service delivery efficiency for the customer using the Six Sigma strategy. Therefore, the researchers in this research study the possibility of applying the Six Sigma strategy to the health sector institutions in Baghdad for both medical personnel and medical patients. It was also found through the results of the questionnaire distributed to health sector employees in Baghdad that the government hospital's support for employees and workers in the sector needs

more support, as most of the answers indicated a weakness in employee development, promoting development and guidance, encouraging communication and dialogue with their managers. As for the results of medical patients in the health sector, the results showed that the majority suffer from a long waiting time to see a doctor, not taking into account people with special needs, not feeling the doctor's interest, not developing and updating used medical supplies, not updating patients' lounges, difficulty booking appointments, etc. It was found through the results that the research hypothesis that states that government hospitals do not



apply modern methods of quality for administrative accounting to increase the performance efficiency of the hospital despite the presence of application requirements in these hospitals has been proven to be correct. Therefore, it is possible to improve performance and raise quality in the health sector in Baghdad by applying and using the Six Sigma strategy. Whereas, the Six Sigma system is based on basic criteria based on defining the procedures and then measuring their level, analyzing them, then developing them and reaching the highest stages of quality control in the procedures, in addition to that it requires the commitment of higher authorities, training and organizational culture, and Six Sigma is not a topic that revolves around quality itself, but rather the provision of value Better for beneficiaries and employees.

#### **RECOMMENDATIONS AND FUTURE RESEARCH**

The researchers recommend applying the Six Sigma strategy in the government health sector in Baghdad and Iraq to achieve the highest levels of quality and efficiency in performance. The researchers also recommend studying the possibility of applying this strategy in other sectors in Iraq to study its efficacy as future studies.

#### **SOURCES:**

1. Hassouni, Hamza Sadiq 2012 "The Role of Strategic Management Accounting Methods in Serving the Strategic Management of Contemporary Organizations in Iraq, Al-Muthanna Journal of Administrative and Economic Sciences, Issue 4 (V. 2, pp. 199-221), Al-Muthanna University, Iraq.
2. Zorob 2013 "An Analytical Study of the Use of Management Accounting Methods in Companies Listed on the Palestine Stock Exchange" Journal of the Islamic University for Economic and Administrative Studies, Issue (21, No. 2), Azza, Palestine.
3. Zoelf, Inaam 2012, "Application of modern management accounting methods in Jordanian public shareholding industrial companies, Middle East University, Amman, Jordan.
4. Sheikh, Imad Youssef 2015 "Using modern management accounting systems to improve the continuous performance of Jordanian public shareholding industrial companies" Journal of Economic and Administrative Sciences, Issue 81 (P.21, R.363-397), University of Baghdad, Iraq
5. Siddiq, Babiker Ibrahim 2014 "Management Accounting and its Role in Evaluating the Efficiency of Financial Performance" Sudan University of Science and Technology, Sudan.
6. Abdel-Wahab, Bushra 2009, "The Contemporary Role of Management Accounting: Renewal or Threat", Journal of Economic and Administrative Sciences, Issue 54 (p. 15, pp. 355-376), University of Baghdad, Iraq.
7. Abdul-Wahhab, Sabah and Emtithal, Al-Taie 2015 "Rationalizing the administrative decision-making process and evaluating performance by employing strategic management accounting methods" 2015, Journal of Economic and Administrative Sciences, Issue 32 (p. 10, r. 103-129), University of Baghdad, Iraq.
8. Al-Asiri, Khaled Hussain 2010. "A proposed conception for the application of the Six Sigma method in the management of the Globe Environmental Program," an unpublished master's thesis, King Saud University, Riyadh.
9. The Arab Administrative Development Organization 2018 "Strategic Management Accounting..Developments of Management Accounting Methods for Performance Evaluation in the Light of the Modern Business Environment" League of Arab States, <https://www.arado.org/ManagementNews/archives/11533>
10. Miloud, Tomy 2015 "Using management accounting tools to improve the financial performance of the economic institution" Mohamed Khedir University, Biskra, Algeria.
11. Nour, Abdel Nasser Ibrahim 2014 "The Impact of Developing Accounting Systems on the Financial Performance in Hotel Establishments" Middle East University, Amman, Jordan.
12. Ten,k.lim,y.ong,h.goh,f.choi,l, (2019) , " Lean Six Sigma Implementation: Does Success Means Sustainability?" International Journal of Academic Research in Business and Social Sciences , vol 9,no (6) .
13. Caballer-Tarazona, M., Moya-Clemente, I., Vivas-Consuelo, D., & Barrachina-Martínez, I. (2010). A model to measure the efficiency of hospital performance. Mathematical and computer modelling, 52(7-8), 1095-1102.
14. Kakwezi, P., & Nyeko, S. (2019). Procurement processes and performance: Efficiency and effectiveness of the procurement function. International Journal of Social Sciences Management and Entrepreneurship (IJSSME), 3(1).



15. Deshmukh, V. K., Mukti, S. K., & Agrawal, A. (2019). Applicability of Lean Six Sigma in Hospitals. In *Advances in Industrial and Production Engineering* (pp. 861-870). Springer, Singapore.
16. Inaam m.al-zwyalif) , 2012," Using Six Sigma Approach to Improve Accounting Information Systems Performance" , *European Journal of Economics, Finance and Administrative Sciences*, ISSN 1450-2275 Issue 55 December, 2012.
17. Gary cokins 2015 ,"The Top 7 Trends in Management Accounting" <https://www.cchcpelink.com/top7trends>
18. Asgar,taleei, Farhad, Hanifi (2015) Accounting information system and management's decision making process" DOI : 10.5267/j.msl.2015.5.004 .
19. Alero,obazee,solabomi,ajibolade (2019) "The influence of stakeholders on management accounting practice", *Journal of Sustainable Finance & Investment*