

Using the six Sigma model to adjust the quality of forensic Auditing An applied study on the Egyptian Environment

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Received: 19th August 2021

Revised: 14th September 2021

Accepted: 15th October 2021

Section 1: General framework for research

1- Introduction and the nature of the problem

The research is intended to suggest using the six Sigma model to adjust the quality of the forensic Auditing work. It notes recently the spread of the so-called phenomenon of financial and administrative corruption, in which Egypt has recently occupied very advanced levels. This has given rise to many risks for businesses in Egypt, where many companies and institutions, both domestic and global, are involved in embezzlement and many other crimes resulting from the spread of these phenomena.

Because of strong trends toward fighting financial and administrative corruption, especially after the successive developments and collapses that caused the collapse of many large companies around the world, and caused the recent global financial crises, which have led to poor accounting and auditing mechanisms in detecting financial and administrative corruption issues. This has led to the emergence of so-called forensic auditing to adjudicate financial disputes within a legal framework.

Many attempts have been made in accounting literature over recent periods to develop accounting and auditing and to link it with the law on the one hand and the needs of the judiciary and courts with accounting information on the other, which has led to the emergence and increasing need for forensic accounting services for external financial auditing

Forensic accounting outputs and reports containing appropriate information to guide judges and relevant parties in making judgments and decisions against conflicting parties on legal financial issues. Forensic accounting requirements require a range of experiences that outweigh the traditional accountancy and auditing profession, and forensic accounting generally, as covering a large area of specialization, requires in-depth knowledge of

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investigations and forensic information technology, litigation support, dispute resolution, and accounting knowledge

Despite the novelty of the science and concept of (forensic) accountant, his profession the forensic auditor is one of the oldest professions in history, where he may be dating back to the ancient Egyptians, where his principal employer was a forensic investigative auditor for Pharaoh who was the awake-in-ear king of the awake-awake king on the stock of Grain, gold, and other assets one of the most important features of this employee was that he was well-placed to the king and able to take responsibility and also able to deal with the influential people within the royal court¹

The term forensic auditing refers to a comprehensive view of the verification of fraud in financial statements. Forensic auditing includes the prevention of fraud and analysis of controls against it, and forensic auditing includes the audit of accounting records to look for fraud proof⁽²⁾.

Thus, the forensic authorities must have a number of accounting and auditing skills, as well as advanced investigative, law and forensic dispute skills. However, there is no interest in Arab countries in general and Egypt, especially in developing curricula and qualification methods for accountants and auditors in that field to carry out forensic accounting tasks.

On the other hand, in the face of challenges posed by the intense competition environment and the rapid technological development of local and global business organizations, organizations have sought to find sophisticated ways and means to minimize error, six Sigma, a technology that helps business organizations reach a high degree of quality in their products. The term indicates that the process does not result in more than 3-4 defects per million opportunities, i.e. the organization may provide virtually flawless goods or products, which are done by constantly improving through (5) specific stages of the organized work. At each stage, a set of activities is implemented; these phases begin with the problem identification phase, followed by the measurement phase, analysis, improvement phase, and end with the monitoring and control phase⁽³⁾. Define, analyze, measure, improve, control

Many organizations in both goods and service lines are seeking to implement six Sigma, which is based on performance monitoring, daily activities and business to achieve a high degree of quality in which waste and opportunity are reduced to meet customers' needs if some see that Sigma Six are three-part conceptual framework, "they are:

1. Statistical measure of performance related to operations, product manufacturing or service delivery as in commercial banks
2. A management system to drive leadership and performance at a high level.
3. Methodology for improving Operations"⁽⁴⁾.

Many studies have been conducted on the use of six Sigma to improve business quality in accounting and auditing, such as applying its use to improve internal audit quality, rationalizing investment decisions, auditing..... Most of these studies have demonstrated the importance of using six Sigma in this area

The researcher seeks through this research to study and suggest using the six Sigma model to justify the forensic auditing and its dangers in light of the spread and spread of the so-

called financial and administrative corruption, and to conduct a field study on a sample of the Egyptian audit offices in which the forensic auditing sections were developed. The Egyptian environment has many financial and administrative anti-corruption regulators, such as the Central Auditing Agency (CAA), the National Anti-Corruption Academy, and the General Authority for Financial Supervision...

By auditing the global accounting literature on this subject, the researcher notes the weakness of relevance for forensic auditing, most studies in this topic have focused on using the six Sigma model to improve the quality of internal audit work

The problem of research is thus crystallized by a key and important question: Forensic auditing is now being carried out in Egypt, but its application raises several questions, the most important of which are:

- Does the official application of forensic auditing in the Arab Republic of Egypt increase the efficiency and qualification of auditors to detect fraud and mislead, and to integrate auditing and law?
- Is the use of the six Sigma model applied in accounting and auditing as service areas and used in industry?
- How far has the use of the six Sigma model been applied to increasing the efficiency of forensic auditing in Egypt?
- What impact does applying the use of the six Sigma model have on adjusting the quality of forensic auditing work in Egypt's audit facilities, audit offices, and other regulators?

2- Research objectives and importance:

2/1 Search objectives:

The main purpose of the research is to demonstrate the impact of applying the use of the six Sigma model on adjusting the quality of the forensic auditing work in the audit facilities and offices by applying a sample of the auditing offices that apply the forensic auditing and in order to achieve the main objective of the study, the researcher examines the following points:

- Test the impact of using the six Sigma model on the competence and qualification of auditors to detect fraud and misinformation and integrate revision and law
- Test the impact of using the six Sigma model on the quality of the forensic auditing process by applying to a sample of Egyptian auditing offices applying forensic auditing.
- Arrive at the results of the study on the impact of using the six Sigma model on the quality of the forensic auditing

2/2 importance of research:

The importance of research can be summarized in the following points:

- Contribute to providing accounting literature with a study on the impact of using the six Sigma model on external audit work
- Contribute to providing accounting literature with a study to link the quality of external audit work the impact of using the six Sigma model on the quality of external audit work as well as the impact of use on forensic auditing work.

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- To contribute to highlighting the importance of implementing the forensic auditing work in the audit offices and facilities in Egypt as an important tool to link and address the needs of the forensic authorities and the administrative investigation authorities of the accounting and financial experience of the audit team members in the audit offices and facilities in Egypt
- Contribute to the emphasis on the importance of using six Sigma standards to improve the efficiency of forensic auditing mechanisms as they are currently being applied
- Contribute to the emphasis on the importance of using six Sigma standards in adjusting the quality of forensic auditing work.

3- Search hypotheses:

The first major hypothesis:

"There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and meeting the needs of reporting users and financial lists."

This imposition has been divided into the following three sub-hypotheses:

Sub-hypothesis 1:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the upgrading of auditors' efficiency to detect fraud.

Sub-hypothesis 2:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the reduction of the audit gap

Sub-hypothesis 3:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and increased confidence in the auditing profession

Second major hypothesis:

"There is no statistically significant relationship between the implementation of the six Sigma model and the upgrading of forensic auditing processes at Egypt's audit facilities"

The third major hypothesis:

"There is no statistically significant relationship between applying the six Sigma model and raising the quality of the auditing work in Egypt"

These two subsections are divided:

Sub-hypothesis 1:

There is no statistically significant relationship between the six Sigma model and the enhancement of the reputation and competitive position of the applied Audit Office.

Sub-hypothesis 2:

There is no statistically significant relationship between using the six Sigma model to increase the experience and competence of the auditing team members of the office in place.

4- Study Plan:

The study in the conceptual framework aims to address the following points:

- 1- Forensicauditing (concept - importance - its impact on the quality and credibility of financial statements).
- 2- Six Sigma model and use it to adjust business efficiency.
- 3- Examine the impact of using the six Sigma model on the quality of forensicauditing work.
- 4- The field hypotheses study assesses the study sample responses and discusses the results.
- 5- Conclusions and recommendations
- 6- List of references

5- Theoretical framework

5/1 Forensicauditing (concept-importance-impact on the quality and credibility of financial statements)

Through reviewing of accounting and forensic audit studies, the researcher found that many studies have addressed the concept and nature of forensic audit services and mechanisms, and examined the differences between forensic accounting and research in its subjects of university accounting as a methodology to meet the increasing need for specialists in this field. In order to achieve the many benefits of this new professional specialization, the researcher will address the importance of forensicauditing in this section and will address the subject of forensicauditing through the following points:

5/1/1 concept of forensicauditing.

5/1 2 objectives of forensicauditing.

5/1/3 importance of forensicauditing.

5/1/4 areas (services) of forensicauditing.

5/1/5 methods and methods of forensicauditing (mechanisms) to detect fraud and corruption and to achieve the quality and credibility of the judiciary financial statements.

5/1/6 determinants of the quality of forensicauditing

5/1/1 concept of forensicauditing.

Forensicauditing is one of the most recently developed magazines to reduce fraud and their ramshackle of financial and administrative corruption. "It is a technique that involves a set of procedures used by the auditor to obtain evidence to help him uncover the circumstances and ambiguities of the problem in question, such as fraud of many types, including corruption, bribery, extortion, and conflicts of interest, with a view to obtaining money, as well as asset

theft and the imitation of financial information by books and records." ⁽⁵⁾ Given the recent field (accounting and forensic auditing), there are many definitions that represent destinations for researchers, some of which will be presented to reach a comprehensive concept of forensic auditing

Definition of the American Institute of Accountants (AICPA) (2004) ⁽⁶⁾.

"A professional service that combines forensic skills, research and investigation skills to reach a directory used to resolve disputes between different parties, and are primarily concerned with disclosure of financial statements, financial corruption, and financial corruption in business organizations." (Khalil, Mohamed Ibrahim, *op. cit.*)

El Gammal (2002) ⁽⁷⁾.

One type of accounting based on an appropriate accounting analysis of the court that forms the basis for the resolution of financial disputes, or "an activity involving the collection, operation, analysis and validation of data, with a view to obtaining evidence of financial and financial irregularities and disputes, in coordination with the internal and external references of the company; In addition to other stakeholders and others" (Beauty, Ceyhan, (2002), *op. cit.*)

Aly (2009) ⁽⁸⁾.

An integrated professional process designed to take account of the references beyond documents through investigative processes, witness, trial, fraud detection, corruption, and corruption with the preparation of the report to stakeholders in the establishment or investigation and pre-court litigation

Radi (2011) ⁽⁹⁾.

AICPA Definition: "Use of accounting and auditing skills, finance, quantitative methods, and law, and other skills, including research and investigation skills, for the purpose of compiling, analyzing and evaluating evidence.

As we have already pointed out, recent economic collapses and financial scandals of major corporations¹⁰ researchers, professional institutions and competent authorities have sought to examine the reasons for this, and Mary L., et.al, (2008) ⁽¹¹⁾. This has led to a lack of transparency in financial reporting, which has led to a loss of confidence and often of utility, and thus to increased attention to the areas of accountability and forensic auditing.

5/1 2 objectives of forensic auditing

By reviewing of previous studies, the researcher can summarize the objectives of forensic auditing in the following points:

- 1- Provide financial and accounting information for legal purposes, as this is the link between the accounting system and the legal system, thus providing accounting analysis according to the needs of the judiciary to resolve the cases in question¹² (Radi, (2011), *op. cit.*, p. 86)
- 2- Prevention, detection of fraud, corruption and misuse of public money
- 3- Identify illegal activities that cause fraud, encourage the necessary evidence and report to show professional opinion in neutral, to assist in the adjudication of forensic disputes¹³ (Jamal, (2002), *op. cit.*, p.)

- 4- Preparing separate professional forensic auditors with knowledge of accounting, auditing and investigative skills, which enable them to contribute to the adjudication of litigation and forensic financial disputes
- 5- Seek to increase the efficiency and effectiveness of the auditing profession, to fulfill its new responsibilities
- 6- Re-trusting accountants and auditors that were rattled by successive financial collapses of countries and companies around the world due to the gap in audit expectations

5/1/3 importance of forensic auditing:

Reviewing previous accounting studies in the area of the importance of accounting and forensic auditing, the importance of forensic auditing can be determined by the following points:

- 1- One of the most important new areas with many opportunities to meet the needs of the future is the identification of the future and the characteristics required in the accountant and the auditor, especially as the American Institute of Chartered Accountants (AICPA) and some other professional organizations have emphasized the inadequacy of the current scientific qualification of auditors to detect fraud ^{and} misinformation.¹⁴
- 2- Forensic auditing is an integral between auditing and law, so the forensic auditor is a high-level forensic adviser
- 3- Beyond the numbers, they look for the validity of legal procedures and the integrity of conduct, i.e. they do more research and study to uncover the facts
- 4- It contributes to increase efficiency and effectiveness of the external audit process, thereby increasing the efficiency, effectiveness and confidence of the auditing profession, and detecting fraud and errors in financial statements¹⁵
- 5- Contributing to reducing the audit forecast gap, as the auditing profession as it stood and its current situation could not reduce that gap.
- 6- Address the needs of the judiciary and the courts as financial experts and advisers to provide accounting and financial information for legal purposes.
- 7- Increase confidence in financial statements and accounting information, detect and prevent money laundering fraud¹⁶

5/1/4 Fields (services) of forensic auditing.

The services provided by forensic auditing vary, and the types of forensic auditing services can be determined by the perspective to be determined as follows:

1- Types of forensic auditing services from a time perspective (timing)

A- Previous Service ⁽¹⁷⁾.

They are interested in examining the elements of the internal control system and identifying the most vulnerable activities, thereby helping to prevent crime and ensuring the application of the relevant laws

B-Reactive Service successors

Or therapeutic, to investigate suspicious processes and activities, and to provide technical support services

2- Types of forensic auditing services from the perspective of the nature of the service

A-Fraud detection services committed by users.

B-Criminal investigation services, especially as the subject relates to financial results

C- A partner exit treatment in the event that a partner or one of them objects to a settlement by the company's auditor and arbitration is applied where the forensic auditor correctly evaluates the assets and liabilities.

D- Adjudication in cases of occupational neglect, such as non-compliance with accounting and auditing standards, the accountant or forensic auditors estimates losses resulting from occupational neglect

E-Arbitration services provided by court authorities to mediate the resolution of business community disputes such as: Insurance problems (insurance policies), contractual violations, building claims, trademark infringement, invention rights, Marriage disputes (by valuing the assets and obligations of the spouses). ⁽¹⁸⁾. (Razek, *op. cit.*, p. 51)

51/5: Methods (mechanisms) for forensic auditing, to discover fraud and corruption and to adjust the quality and credibility of the judiciary financial statements

By reviewing some of what was mentioned in the accounting and auditing literature to the most important mechanisms and methods of forensic auditing to combat financial and administrative corruption in control and arbitration environments, where the aim is to facilitate the tracking of intended and unintended errors, and some have mentioned ⁽¹⁹⁾.

The set of procedures followed in Egypt in the event of forensic disputes, whether regarding the financial statements and what they may contain of fraud or deception, or tax disputes. However, the researcher believes that this concerns the Egyptian environment only, and that it is necessary to identify mechanisms that can be applied in any society for forensic auditing, such as ⁽²⁰⁾:

- Activating corporate governance mechanisms and rules to confront fraud
- Activating anti-money laundering mechanisms, and ensuring the correct application of its law
- Develop accounting and auditing standards, to prevent abuse of the flexibility of accounting treatments (alternative treatments) for fraud and profit management
- Developing accounting work mechanisms, through:
 - 1- Detecting fraud committed by users
 - 2- Criminal investigation: especially if the matter is related to financial results.
 - 3- Settlement of a partner's exit, in the event that one of the partners objects to the settlement, which is carried out by the company's auditor, and resorts to the forensic accountant who can correctly determine the value of assets and liabilities

- 4- Estimation of losses resulting from professional negligence as a result of violating accounting standards
- 5- Forensic auditing is exercised through two methods⁽²¹⁾:

1-Interactive auditing It aims to conduct thorough investigations about illegal or suspicious areas and activities to determine the presence or absence of fraud in them, and to collect appropriate and acceptable evidence to support lawsuits.

2-post auditing It aims to examine several aspects, including the following:

A-Legislative auditing Studying and evaluating the internal control systems, and ensuring the protection of assets

B-Regulated compliance auditing it is in government establishments with the aim of ensuring compliance with laws and regulations when disbursing and proving payments and receipts.

C-Diagnostic management: It is used to conduct examinations to determine the risks resulting from fraud and to focus on examining the target areas⁽²²⁾.

Through the previous presentation of forensic auditing as an emerging branch of knowledge from the branches of accounting and auditing, it can be said that despite the fact that it enjoys wide attention by practitioners of the profession and the competent authorities such as the judiciary, it is scarcely written about it, despite it being an effective tool for detecting, limiting and reporting on fraud and what is They are accompanied by financial and administrative corruption, which is the main cause of economic collapse. There are many mechanisms through which forensic auditing can be practiced to achieve its objectives, but the identification of factors determining the quality of forensic auditing work has not received sufficient attention by researchers.

5/1/6 Determinants of the quality of forensic auditing:

In view of what was previously mentioned about the lack of studies in the field of forensic auditing quality, the researcher will test the determinants of the quality of external auditing - given that forensic auditing services in Egypt are currently carried out through some auditing offices - as determinants of the quality of forensic auditing as well. The researcher was able to determine it by extrapolating some previous studies. Vivien & Others 2012, Abi Khalida, Yacobi Mohamed 2013,⁽²³⁾

It consisted of:

First: Factors related to the audit office, which are:

- 1- Audit office size
- 2- Audit office reputation
- 3- Competition between audit firms
- 4- The audit firm's commitment to professional standards
- 5- The extent to which the references relate to the client
- 6- Auditing process fees
- 7- on audit assignments
- 8- The audit office provides consulting services to the client

Second: Factors related to the audit team, which are:

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- 1- independence of references
- 2- Auditing team experience
- 3- Supervising the auditing team
- 4- Good communication with the customer
- 5- The experience of the audit office in the industry to which the client belongs

Third, factors related to the entity are:

- 1- The size and financial strength of the entity being audited
- 2- Effective internal control structure

The importance of applying these determinants to achieving the quality of forensic auditing work will be tested through the field study of this research

4- Study the effect of using Model Six sigma on the quality of forensic auditing work:

As the researcher previously indicated, there are many studies in the accounting and auditing literature that dealt with Model Six sigma and its use in the areas of quality control. In this section, the researcher will address the impact of its use to justify the quality of forensic auditing work by addressing the following points:

4/1 Use Model Six sigma to justify audit work:

In recent times, total quality management has been developed with the aim of finding advanced methods and methods that reduce the percentage of errors in the wrong products; It was one of the most important of these methods Model six sigma, where depend Organizations to reach the highest levels of accuracy and quality using statistical tools. They monitor performance, activities, and daily work in order to reach an advanced degree of total quality, so that the chances of lost and defective products are reduced, knowing that the higher the complexity of the product, the greater the possibility of errors (Al-Nuaimi 2007) ⁽²⁴⁾.(Al-Nuaimi, Mohamed Abdel-Al(2007),Six Sigma: A Modern Approach to Facing Defects, Scientific Conference of Al-Zaytoonah University, Amman Arab University for Graduate Studies). This technology is considered a way to improve operations that depends on collecting customer feedback and using analysis techniques to drive the improvement process. Many studies and research have been exposed to how to use this technology to justify the quality of the work of many areas such as control and internal control, banking services, investment decisions..... However, its use to justify the quality of auditing has not received sufficient attention. Therefore, the researcher will present in this part how to use the technology Six sigma to justify the quality of work, then suggesting its use to justify the quality of forensic auditing.

4/1/1 Standards Model Six Sigma for quality:

Select each (Salaheldin and Abdelwahab, 2010: 23-25) and Antony and Bhaiji, 2003: 2) (Pande and Holpp, 2002: 14-16) Standards for Six Sigma are:

- (1) **Senior Management Support and Commitment:** The support and commitment of senior management to technology Six sigma is a prerequisite for the success of its application, because the commitment of senior management carries with it a message of persuasion and motivation for employees at all administrative levels to implement it.

- (2) **Reverse feeding:** As the availability of feedback (feedback) on quality programs and the performance of employees and managers on a regular basis and in a timely manner, allows for continuous improvement and thus raising the level of quality.
- (3) **continuous improvement:** Continuous improvement is based on the assumption that work is a series of interrelated steps and activities that lead to a targeted outcome, and continuous improvement is an important axis to reduce deviations during technical operations, and thus increase quality
- (4) **Operations and systems:** It is considered a method Six sigma Every technical procedure pursued by the organization is a process in itself, so the approach considers that processes and systems are the main axis that helps the organization to achieve success on an ongoing basis.
- (5) **Human Resources:** Curriculum Six sigma is linked to human resources by linking the rewards and incentives of senior management to the success of its application and the appointment of experts and consultants in that technology.

4/1/2 Application stages Model Six Sigma Quality Control

that the goal of Six Sigma is the reduction of differences in processes and services using the continuous improvement methodology and this is called the DMAIC methodology, which is used to reduce defects in the existing processes, which is a set of steps or stages (5 stages) ⁽²⁵⁾.

(1) Define the problem

Where the team leader studies the existing project and its initial objectives, then the criteria for its development, then analyzes the poor quality cost of the process and makes an estimate (estimate) for the new process. At this stage, the team members who are responsible for identifying the work needs are identified, and an illustration of the process that the team will work on is drawn up.

(2) measurement

The team determines the internal processes that affect the critical characteristics of quality, measures the defects associated with those processes, and studies the basic components of the system that include the outputs, which are the final results of the process (such as the number of defects, the level of customer satisfaction, profits), and it depends On the inputs, poor inputs produce poor outputs, so the measurement of inputs also supports the definition of the problem

(3) Analysis

In this stage, the team identifies the possible causes, differences and defects that affect the output of the process using practical tools such as cause and effect, so the team explores the possible methods for the problem that may arise from different sources such as methods (methods and techniques used in work, machines, technology, materials, instructions, numbers, facts, types Defects and their number, external environment, human resources. Then the team connects the collected data, uses standards and experiences, auditings processes, guesses a principle or hypothesis about the causes of the problem, then searches the data to show its suitability with the proposed causes and analyzes it to reach the real root causes of the problem.

(4) optimization

At this stage, a set of activities that contribute to improving performance and raising the level of the organization are identified, where the team uses analytical tools that enable to find and identify possible solutions after determining the basic variables and their impact on the critical characteristics of quality. Where does the team Sigma by targeting the independent variables affecting the problem and causing the positive or negative effects of the dependent variable (the target result of the improvement process)

(5) censorship

In it, it is ensured that the improvements will last for a long period of time, and the team develops some tools to help control the process, and the ultimate goal of this stage is to reduce the difference by controlling the inputs and monitoring the outputs.

4/1/3 The effect of using the methodology Six Sigma to justify the quality of forensic auditing work

Through the field study, the researcher will test the effect of using the methodology Six sigma referred to to justify the quality of forensic auditing work, as will be detailed, by studying the effect of using six sigma mechanisms in increasing the effectiveness of forensic auditing mechanisms and tools, and raising their quality.

Second section

Applied study to test study hypotheses and evaluate responses the study sample and discuss the results.

First: the study population and sample

The researcher relied on the survey method in collecting the necessary data to test the research hypotheses, as they were designed and tested before distributing them to the study sample. The refusal strongly, and the researcher relied on the following law to determine the sample size:

Allowable standard error = standard degree s (1- s)

$$\frac{\sqrt{S(1 - S)}}{N}$$

The following assumptions have been made:

- N = SAMPLE SIZE

- S = MEANS THE PERCENTAGE OF AVAILABILITY OF CHARACTERISTICS IN THE RESEARCH COMMUNITY, WHICH IS USUALLY ASSUMED AT A VALUE OF 50%.

THE CONFIDENCE COEFFICIENT IS 90% WITH AN ALLOWABLE ERROR OF (+,-) 10%.

THE STANDARD DEGREE OF CONFIDENCE COEFFICIENT 90% OF THE STATISTICAL TABLES = 2

Applying the following assumptions, the sample size is as follows:

$$0.01 = \frac{2 \sqrt{0.5 \cdot 0.5}}{N}$$

SAMPLE SIZE = 100 ITEMS, 9 . Were collected7 A valid questionnaire for statistical analysis as shown in the following table:

Table (1) Distribution of the study sample

the number	the side
25	Central Auditing Organization
19	University Professor
13	Accountant
17	expert at the Ministry of Justice
13	Tax expert
10	Financial Analyst
97	Total

Second: Statistical processing methods:

Statistical software was used SPSS Ver.20 for data analysis, using the following methods:

- T-test and its level of morale to measure the discriminatory validity of the questionnaire.
- Frequencies, ratios, and averages to describe the study sample.

Correlation coefficient to measure the strength and direction of the correlation between variables.

Linear regression to show the regression relationships between variables.

Third - Discriminatory honesty using the t-test:

Table (2) Discriminatory honesty using t-test

Phrase	ValuesNS	morale	Middle Differences	Category world	Category upper
Application Mechanisms Auditing	65.897	.000	4.536	4.40	4.67
Lift efficiency auditingers	58,462	.000	4.454	4.30	4.60
Lift efficiency auditingers	65.356	.000	4.505	4.37	4.64
Reduction gap Expectations	58,767	.000	4.485	4.33	4.64
More trust	69.845	.000	4.567	4.44	4.70
More trust	67.443	.000	4.536	4.40	4.67
Application 6 sigma	63,531	.000	4.474	4.33	4.61
Lift efficiency Business Auditing	67.663	.000	4.546	4.41	4.68
Lift efficiency Business Auditing	60.488	.000	4.402	4.26	4.55
Lift efficiency Business Auditing	60.675	.000	4.443	4.30	4.59

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Lift efficiency Business Auditing	72.395	.000	4.515	4.39	4.64
Lift efficiency Business Auditing	53.071	.000	4.474	4.31	4.64
Improvement reputation	69.579	.000	4.557	4.43	4.69
Improvement reputation	62.095	.000	4.464	4.32	4.61
Improvement reputation	66.841	.000	4.577	4.44	4.71
More Experience	63.427	.000	4.464	4.32	4.60
More Experience	67.663	.000	4.546	4.41	4.68
More Experience	57,151	.000	4.412	4.26	4.57
More Experience	51.131	.000	4.423	4.25	4.59

Looking at the previous table, it is clear that the trends of the study sample in all its categories differ significantly, where the t-test values were significant for all expressions. That is, the research sample realized and distinguished the meaning of the questionnaire phrases according to their different experiences and their business fields.

Fourthly: hypothesis testing

1- The main hypothesis test the first:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and meeting the needs of users of reports and financial statements

This hypothesis has been divided into a number of sub-hypotheses that are tested as follows:

1-1 The first sub-hypothesis of the first main hypothesis:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and raising the efficiency of auditors to detect fraud and deception.

To prove the validity of this hypothesis, we perform a number of tests as follows:

Table (3). Test results to force The first sub of the hypothesis President the first

Model Summary

Model	R	R Square	Adjusted R Square	std. Error of the Estimate	
1	.773a	.597	.589	.435	
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	26,354	2	13.177	69.704	.000b
1 Residual	17,770	94	.189		
Total	44.124	96			

** Statistically significant at statistic level 0.01

Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Implementation of external audit mechanisms and between Raising the efficiency of auditors to detect fraud and deception, where was the value of the coefficient The Engagement "r" 0.773, which is a statistically significant value at a significant level of 0.01, and indicates that the higher the effectiveness of Implementation of external audit mechanisms Increased auditors' efficiency in detecting fraud and misinformation.
- There is a regressive relationship between Implementation of external audit mechanisms and between raising the efficiency of auditors to detect fraud and deception, where the value of the q-test was 69.704 statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.597$, which means that Implementation of external audit mechanisms explain Raising the efficiency of auditors to detect fraud and deception in the rate of 59.7%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis correct the first sub of the hypothesis President the first, accepting the alternative hypothesis, which means that he:

There is a statistically significant relationship between the application of forensic auditing mechanisms in Egypt and raising the efficiency of auditors to detect fraud and deception.

1-2 The second sub-hypothesis of the first main hypothesis:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the reduction of the expectations gap in the auditing.

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To prove the validity of this hypothesis, we perform a number of tests as follows:
Table (4). Test results to force the second sub of the hypothesis President the first

Model Summary

Model	R	R Square	Adjusted R Square	std. Error of the Estimate	
1	.609a	.371	.365	.540	
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	16,381	1	16,381	56.093	.000b
Residual	27,743	95	.292		
Total	44.124	96			

** Statistically significant at statistic level 0.01

Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Implementation of external audit mechanisms and between Reduce the expectation gap in audit, where was the value of the coefficient The Engagement "r" 0.609, which is a statistically significant value at a significant level of 0.01, and indicates that the higher the effectiveness of Implementation of external audit mechanisms Further reducing the expectations gap in the auditing.
- There is a regressive relationship between Implementation of external audit mechanisms and between Reduce the expectation gap in audit, where the value of the q-test was 56.039 statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.371$, which means that Implementation of external audit mechanisms explain Reduce the expectation gap in audit in the rate of 37.1%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis correct the second sub of the hypothesis President the first, accepting the alternative hypothesis, which means that he:

There is a statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the reduction of the expectations gap in the auditing.

1-3 The third sub-hypothesis of the first main hypothesis:

There is no statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the increase in confidence in the audit profession.

To prove the validity of this hypothesis, we perform a number of tests as follows:
Table (5). Test results to force The third sub of the hypothesis President the first

Model Summary

Model	R	R Square	Adjusted R Square	std. Error of the Estimate	
1	.608a	.369	.356	.544	
Model	Sum of Squares	df	Mean Square	F	Sig.

	Regression	16,291	2	8.145	27,509	.000b
1	Residual	27,833	94	.296		
	Total	44.124	96			

** Statistically significant at statistic level 0.01

Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Implementation of external audit mechanisms and between Increase confidence in the audit profession, where was the value of the coefficient The Engagement"r" 0.608, which is a statistically significant value at a significant level of 0.01, and indicates that the higher the effectiveness of Implementation of external audit mechanisms Increased confidence in the audit profession.
- There is a regressive relationship between Implementation of external audit mechanisms and between Increases confidence in the audit profession, where the value of the q-test was 27,509statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.369$, which means that Implementation of external audit mechanisms explain Increase confidence in the audit profession in the rate of 36.9%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis correct the third sub of the hypothesis President the first, accepting the alternative hypothesis, which means that he:

There is a statistically significant relationship between the application of forensic auditing mechanisms in Egypt and the increase in confidence in the audit profession.

By proving that the sub-hypotheses of the first main hypothesis are incorrect, and therefore the first main hypothesis is rejected, and the alternative hypothesis is accepted, that is: **There is a statistically significant relationship between the application of forensic auditing mechanisms in Egypt and meeting the needs of users of reports and financial statements.**

2The main hypothesis test the second:

There is no statistically significant relationship between the applications of criteria SIX SIGMA raising the efficiency of forensic auditing work in audit facilities in Egypt

To prove the validity of this hypothesis, we perform a number of tests as follows:

Table (6) . test results to force President The second

Model Summary						
Model	R	R Square	Adjusted R Square	std. Error of the Estimate		
1	.822a	.676	.658	.406		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	31.201	5	6.240	37.897	.000b
	Residual	14,984	91	.165		
	Total	46.186	96			

** Statistically significant at statistic level 0.01

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Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Apply standards SIX SIGMA And to raise the efficiency of forensic auditing work in audit facilities in Egypt, where was the value of the coefficient The Engagement "r" 0.822, which is a statistically significant value at a significant level of 0.01, and indicates that the more Apply standards SIX SIGMA It has increased the efficiency of forensic auditing work in audit facilities in Egypt.
- There is a regressive relationship between Apply standards SIX SIGMA and between raising the efficiency of forensic auditing work in audit facilities in Egypt, where the value of the q-test was 37.897 statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.676$, which means that Apply standards SIX SIGMA explain Raising the efficiency of forensic auditing work in audit facilities in Egypt in the rate of 67.6%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis corrects President the second, accepting the alternative hypothesis, Which means that he:

There is a statistically significant relationship between the applications of standards SIX SIGMA raising the efficiency of forensic auditing work in audit facilities in Egypt.

The main hypothesis test the third:

There is no statistically significant relationship between the applications of the curriculum SIX SIGMA raising the quality of audit work in Egypt

This hypothesis has been divided into a number of sub-hypotheses that are tested as follows:

3-1 The first sub-hypothesis of the third main hypothesis:

There is no statistically significant relationship between the use of criteria SIX SIGMA Improving the reputation and competitive position of the implementing audit firm.

To prove the validity of this hypothesis, we perform a number of tests as follows:

Table (7) . Test results to force The first sub of the hypothesis President the third

Model Summary

Model	R	R Square	Adjusted R Square	std. Error of the Estimate	
1	.535a	.286	.263	.595	
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	13.223	3	4.408	12.435	.000b
Residual	32.963	93	.354		
Total	46.186	96			

** Statistically significant at statistic level 0.01

Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Use criteria SIX SIGMA and between Improving the reputation and competitive position of the implementing audit firm, where was the value of the coefficient The Engagement "r" 0.535, which is a statistically significant value at a significant level of 0.01, and indicates that the more Use criteria SIX SIGMA The reputation and competitive position of the implementing audit firm further improved.
- There is a regressive relationship between Use criteria SIX SIGMA And between improving the reputation and competitive position of the audit office in place, where the value of the q-test was 12.435 statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.286$, which means that Use criteria SIX SIGMA explain Improving the reputation and competitive position of the implementing audit firm in the rate of 28.6%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis correct The first sub of the hypothesis President the third, accepting the alternative hypothesis, Which means that he:

There is a statistically significant relationship between the use of criteria SIX SIGMA Improving the reputation and competitive position of the implementing audit firm.

3-2 The second sub-hypothesis of the third main hypothesis:

There is no statistically significant relationship between the use of criteria SIX SIGMA Increasing the expertise and efficiency of the audit team members in the implementing office.

To prove the validity of this hypothesis, we perform a number of tests as follows:

Table (8). Test results to force The second sub of the hypothesis President the third

Model Summary

Model	R	R Square	Adjusted R Square	std. Error of the Estimate	
1	.556a	.309	.294	.583	
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	14.275	2	7.138	21,026	.000b
1 Residual	31,910	94	.339		
Total	46.186	96			

** Statistically significant at statistic level 0.01

Looking at the previous table, it is clear the following:

- found a link Significant expulsion between Use criteria SIX SIGMA and between Increasing the experience and efficiency of the audit team members in the implementing office, where was the value of the coefficient The Engagement "r" 0.556, which is a statistically significant value at a significant level of 0.01, and indicates that the more Use criteria SIX SIGMA The experience and efficiency of the audit team members in the implementing office increased.

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- There is a regressive relationship between Use criteria SIX SIGMA And between increasing the experience and efficiency of the audit team members in the implementing office, where the value of the q-test was 21,026 Statistically significant at 0.01 level and indicates the validity of the regression relationship and the essentiality of the relationship between the two variables.
- Values The coefficient of determination $R^2 = 0.309$, which means that Use criteria SIX SIGMA explain Increasing the experience and efficiency of the audit team members in the implementing office in the rate of 30.9%, and the rest is explained by other variables that were not included in the regression relationship, in addition to random errors resulting from the sampling method, measurement accuracy, and others.

From the above it is clear Non Hypothesis correct The second sub of the hypothesis President the third, accepting the alternative hypothesis, Which means that he: There is a statistically significant relationship between the use of criteria SIX SIGMA Increasing the expertise and efficiency of the audit team members in the implementing office.

By proving that the sub-hypotheses of the third main hypothesis are incorrect, and therefore the third main hypothesis is rejected, and the alternative hypothesis is accepted, that is:

There is a statistically significant relationship between the application of the curriculum SIX SIGMA Raising the quality of audit work in Egypt

Section Three: Results and Recommendations

First: Analysis of the results of the field study

1 Analyzing the results of the field study For the relationship between the application of forensic auditing mechanisms in Egypt and meeting the needs of users of reports and financial statements

Table (9) The results of the field study For the relationship between the application of forensic auditing mechanisms in Egypt and meeting the needs of users of reports and financial statements

NS	Ferries	average
1	The application of forensic auditing mechanisms leads to the achievement of many advantages, raising the efficiency and qualification of auditors to detect fraud and deception	4.536
2	Achieving integration between audit and law	4.454
3	Facing the needs of the judiciary and courts for experts and consultants to provide accounting and financial information for legal purposes	4.505
4	Reduce the expectation gap in audit	4.485
5	Increasing confidence in financial statements and reports by preventing fraud and combating money laundering	4.567
6	Increase confidence in the audit profession	4.536

Looking at the previous table, we find that the arithmetic mean of all the axis expressions is Larger out of 3 degrees (weighted average), where the degree of approval varied between (4.454, 4.567), which means that The application of forensic auditing mechanisms leads to achieving many advantages and raising the efficiency and qualification of auditors to

detect fraud and deception and achieve integration between auditing and the law, in order to meet the needs of the judiciary and courts for experts and consultants to provide accounting and financial information for legal purposes and reduce the expectations gap in the audit; Which leads to an increase in confidence in the financial statements and reports by preventing fraud and confronting money laundering and increasing confidence in the audit profession.

Analyzing the results of the field study For the relationship between the application of standards SIX SIGMA And to raise the efficiency of forensic auditing work in audit facilities in Egypt

Table (10) The results of the field study For the relationship between the application of standards SIX SIGMA And to raise the efficiency of forensic auditing work in audit facilities in Egypt

NS	Ferries	average
1	That the application of standards six sigma To justify the quality of forensic auditing work is done through the use of the standard of support and independence of senior management to persuade and motivate employees at all administrative levels to apply it	4.474
2	Use the standard of feedback to allow continuous improvement and raise the level of quality	4.546
3	Using the process and systems standard, considering all forensic auditing work as a primary focus (processes and systems) to achieve success	4.402
4	Use the measurement standard to identify and measure critical characteristics in forensic auditing	4.443
5	Use the continuous improvement criterion for forensic auditing activities to justify their quality	4.515
6	Using the human resources standard by linking the rewards and incentives of senior management to the successful application of forensic auditing mechanisms	4.474

Looking at the previous table, we find that the arithmetic mean of all the axis expressions is Larger out of 3 degrees (weighted average), where the degree of approval varied between (4.454, 4.402), which means that Apply standards SIX SIGMA Leads to justifying the quality of forensic auditing work is done through the use of the standard of support and independence of senior management to persuade and motivate employees at all administrative levels to apply it, through the use of the standard of feedback to allow continuous improvement and raise the level of quality, and the use of the standard of processes and systems considering all forensic auditing work as a main focus (Processes and systems) to achieve success, and the use of the measurement standard to identify and measure critical characteristics in the work of forensic auditing, and the use of the standard of continuous improvement of forensic auditing activities to justify their quality, in addition to the use of the human resources standard by linking the rewards and incentives of senior management to the successful application of forensic auditing mechanisms.

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3Analyzing the results of the field study For the relationship between the application of standards SIX SIGMA And between improving the reputation and competitive position of the audit office based in the application

Table (11)The results of the field study For the relationship between the application of standards SIX SIGMA And between improving the reputation and competitive position of the audit office in place

NS	Ferries	average
1	Improving the reputation of the implementing audit office	4.557
2	Improving the competitive position of the audit office based in the application	4.464
3	Increasing the audit office's commitment to the professional standards issued in the field	4.577
4	Improving audit tasks in the application office	4.464
5	Increasing the expertise and efficiency of the audit team members in the office	4.546
6	Improving the communication of the audit office with its clients and acquiring new clients.	4.412
7	Improving and increasing the expertise of the audit office in the industry to which the client belongs	4.423

Looking at the previous table, we find that the arithmetic mean of all the axis expressions is Larger out of 3 degrees (weighted average), where the degree of approval varied between (4.577, 4.412), which means that Apply standards SIX SIGMA It leads to improving the reputation of the audit office in force, improving its competitive position, and increasing the commitment to professional standards issued in the field; This will improve the audit tasks in the implementing office, increase the expertise and efficiency of the audit team members in the office, improve the audit office's communication with its clients and acquire new clients, in addition to increasing the audit office's expertise in the industry to which the client belongs.

Secondly: Conclusion

This study is considered a contribution to the field of accounting literature in the field of forensic auditing, as it aimed to suggest the use of the method SIX SIGMA To justify the quality of forensic audit work by applying to the business environment and to achieve this goal, the researcher dealt with the study and analysis of some of what was mentioned in the accounting and auditing literature about the concept, importance and most important areas of forensic audit, as well as auditing and trying to reach the determinants of the quality of forensic audit. The researcher also reviewing the most important studies on the use of technology SIX SIGMA to justify the quality of audit work and the stages of its application, to suggest its use to justify the quality of forensic audit work.

The field study conducted by the researcher concluded the validity of the main assumptions that the application of forensic auditing mechanisms in Egypt leads to meeting the needs of users of financial statements through six axes, and that the application of the mechanisms of SIX SIGMA This leads to raising the quality of forensic audit work in audit firms in Egypt, and improving the reputation and competitive position of the audit firms in place.

Third: The results of the study

The purpose of the study to suggest use style SIX SIGMA To justify the quality of forensicauditing work by applying to the business environment The study reached the following results:

- 1- that The application of forensicauditing mechanisms leads to achieving many advantages and raising the efficiency and qualification of auditors to detect fraud and deception and achieve integration between auditing and the law, in order to meet the needs of the judiciary and courts for experts and consultants to provide accounting and financial information for legal purposes and reduce the expectations gap in the audit; Which leads to an increase in confidence in the financial statements and reports by preventing fraud and confronting money laundering and increasing confidence in the audit profession.
- 2- Apply standards SIX SIGMA Leads to justifying the quality of forensicauditing work is done through the use of the standard of support and independence of senior management to persuade and motivate employees at all administrative levels to apply it, through the use of the standard of feedback to allow continuous improvement and raise the level of quality, and the use of the standard of processes and systems considering all forensicauditing work as a main focus (Processes and systems) to achieve success, and the use of the measurement standard to identify and measure critical characteristics in the work of forensicauditing, and the use of the standard of continuous improvement of forensicauditing activities to justify their quality, in addition to the use of the human resources standard by linking the rewards and incentives of senior management to the successful application of forensicauditing mechanisms.
- 3- Apply standards SIX SIGMA It leads to improving the reputation of the audit office in force, improving its competitive position, and increasing the commitment to professional standards issued in the field; This will improve the audit tasks in the implementing office, increase the expertise and efficiency of the audit team members in the office, improve the audit office's communication with its clients and acquire new clients, in addition to increasing the audit office's expertise in the industry to which the client belongs.

Fourth: Study recommendations

- 1- Pay attention controlling organization in Egypt and amend its laws By rooting the concepts and creating specialized units in forensicauditing, To discover and reduce fraud and financial and administrative corruption practices, achieve integration between audit and law, and meet the needs of the judiciary and courts of financial advisors
- 2- Urge the Egyptian accounting standers organizations to Introduce Egyptian accounting standard amending existing standards to organize forensicauditing work It dealt with its concepts and mechanisms, and set limits for preparing the reports of the forensic references.
- 3- Coordination between the judiciary (Ministry of Justice), regulatory agencies and audit offices on how to achieve integration when applying forensicauditing mechanisms with the help of professionals and academic researchers in the fields of law and Auditing.
- 4- Directing researchers' attention to further studies on methods and forensicauditing activities, and report on the results of their work

Fifthly: future studies and research

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- Effect study Applying forensic auditing work to curb financial and administrative corruption practices in the various sectors of the state.
- Effect study use mechanisms SIX SIGMA In the forensic auditing work on the value of the establishment of the facility under auditing.
- Effect study use mechanisms SIX SIGMA In the forensic auditing work on the value of the audit facility.

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Survey list

Happiness:

Peace, mercy and blessings of God

We address your Excellency with the utmost respect and appreciation, and we ask you to thank you for your kind cooperation for the success of this study, which is related to the use of technology SIX SIGMA to justify the work of forensic auditing in the business environment in the Arab Republic of Egypt, and we hope that you will support and cooperate by participating in completing the questionnaire and returning it to us, knowing that the information we will obtain is for scientific research purposes only and will be kept strictly confidential. Kindly accept the utmost respect and appreciation

Put a mark \checkmark In front of the answer you prefer

The first axis: the application of forensic auditing mechanisms in audit facilities in Egypt and meeting the needs of users of reports and financial statements

The application of forensic auditing mechanisms in audit offices in Egypt leads to meeting the needs of users of financial reports and statements and raising their efficiency through:	Strongly Agree	OK	neutral	rejecting	vehemently refuse
1. The application of forensic auditing mechanisms leads to the achievement of many advantages, raising the efficiency and qualification of auditors to detect fraud and deception					
2. Achieving integration between audit and law					
3. Facing the needs of the judiciary and courts for experts and consultants to provide accounting and financial information for legal purposes					
4. Reduce the expectation gap in audit					

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5. Increasing confidence in financial statements and reports by preventing fraud and combating money laundering					
6. Increase confidence in the audit profession					

The second axis: the application of the curriculum SIX SIGMA To justify the quality of forensic auditing work

syllabus application SIX SIGMA leads to quality control of forensic auditing work through:	Strongly Agree	OK	neutral	rejecting	vehemently refuse
1. That the application of standards Six sigma to justify the quality of forensic auditing work is done through the use of the standard of support and independence of senior management to persuade and motivate employees at all administrative levels to apply it					
2. Use the standard of feedback to allow continuous improvement and raise the level of quality					
3. The use of the process and systems standard, considering all forensic auditing work as a main focus (Processes and Systems) to achieve success					
4. Use the measurement standard to identify and measure critical characteristics in forensic auditing					
5. Use the continuous improvement criterion for forensic auditing activities to justify their quality					
6. Using the human resources standard by linking the rewards and incentives of senior management to					

the successful application of forensicauditingmechanisms					
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The third axis: the effect of using standards SIX SIGMA On the quality of forensicauditing work in audit offices in Egypt

Lead use standards Six SIGMA in the work of forensicauditing in audit offices in Egypt to:					
1. Improving the reputation of the implementing audit office					
2. Improving the competitive position of the audit office based in the application					
3. Increasing the audit office's commitment to the professional standards issued in the field					
4. Improving audit tasks in the application office					
5. Increasing the expertise and efficiency of the audit team members in the office					
6. Improving the contact of the audit office with its clients and acquiring new clients.					