

# Employing the Six Sigma (SS) methodology to reduce the costs of banking service quality: An applied research in Gulf Commercial Bank

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## ABSTRACT

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Due to the economic and technological developments in the business environment and the increasing competition, economic units seek to adopt modern management methods in order to keep up with these developments and achieve their goals by providing high-quality products and services at a low cost to satisfy the customer, enhance their competitive position, and increase their profits. One of the modern management techniques that has been successful when applied for the first time in Motorola is the Six Sigma methodology, Eaton search , Theoretical and practical aspects of which were interconnected by the presence of a solid relationship between Six Sigma and banking service . The theoretical side touched on the most important concepts of the technology Six Sigma, which is (the concept and definition of Six Sigma, the stages of its application, its advantages), the quality of the banking service which is (the concept of the quality of the banking service, its dimensions, its importance, its advantages, and the relationship between the application of the hexagon and the quality of the banking service) .

## Introduction:

The Six Sigma methodology, which aims primarily to reduce errors and defects in processes to a low level of 3.4 errors per million opportunities, with a perfection rate in processes reaching 99.997%. Therefore, the adoption of this technique leads to achieving high levels of quality in goods and services, as well as identifying the sources of errors in administrative processes, proposing solutions, and working on avoiding their recurrence. In addition, it provides management with information related to this matter. The research discusses the extent to which the basic requirements for implementing the technique correctly are available in the Gulf Commercial Bank and the possibility of adopting the Six Sigma methodology. For the success of this application, it is necessary to provide support and commitment from top management to continuous improvement of these costs (Pyzdek, 2003:33).

## Firstly: Research methodology

### 1- The search problem

The problem with research is that banks face high competition, which requires them to develop the level of their services by adopting modern management techniques that contribute to improving the quality of the services provided in order to reduce the costs of distinguished services for their customers and work on increasing them and maximizing their loyalty. This can be expressed by the following question:

Does the bank have the necessary capabilities to meet the requirements of implementing the Six Sigma technique and help in reducing the costs of the quality of banking services?

## **2- Research objective**

The research primarily aims to the following:

- A. Identify the requirements or criteria necessary for implementing the Six Sigma technique.
- B. Indicate the extent to which the requirements for implementing the technique are available in the sample bank.
- C. Provide services to its customers that are on par with competing banks through continuous improvement in all banking operations, as well as helping it reduce service costs.

## **3- The importance of research**

The importance of research lies in the current time for the banking sector, as research sheds light on a modern technology that banks can adopt to improve their performance through the Six Sigma technique, which works to reduce errors and defects in the provided banking services, enhance their quality, reduce costs, and thus strengthen the competitive position of these banks. The importance is also highlighted by supplying management with the necessary information about the availability of the requirements for implementing the technology and the shortcomings in the processes that prevent the full availability of those requirements.

## **4- The research hypothesis**

The research hypothesis can be formulated as follows:

The necessary requirements for implementing the Six Sigma technology and achieving the highest levels of quality in banking services are available at the bank, and the research is based on a hypothesis that states:

**(The Six Sigma approach leads to reducing the costs of the quality of services provided in the Gulf Bank while maintaining the provision of the best banking services).**

## **5- Time and spatial limits for research**

Spatial boundaries: The search has been applied at Gulf Commercial Bank. .

Temporal Boundaries: Temporal Limits for Gulf Commercial Bank Search 2015.

## **Secondly: Six Sigma, theoretical framework**

### **1- the concept of Six Sigma.**

Due to the changes occurring in the economic conditions and the openness of global markets, as well as the increasing awareness among customers to obtain high-quality products or services at competitive prices, economic units are facing a difficult challenge in how to respond to the needs of customers while considering the preservation of manufacturing or service costs and the associated costs within the minimum limit. High costs can lead to the unit being pushed out of competition and losing its ability to continue operating. Therefore, economic units strive to reduce costs by reducing the production or provision of certain units or defective units (Neural & Grover). Just as human nature is always based on the principle of seeking perfection and trying to avoid mistakes whenever possible, the same applies to economic units. They seek perfection, try to avoid mistakes, and work on rectifying defects, whether in their products, services, internal operations, or external processes. Therefore, many methods and techniques have emerged that work on reducing errors and increasing quality. Some of these techniques



are designed to integrate all ideas within a coherent and cohesive management process, and one of these techniques that aims to do so is the Six Sigma technique (Chase et. al, 2003: 2).

Despite the fact that Six Sigma is a statistical measure, it does not require a great deal of statistical skill. It is an administrative system aimed at achieving sustainable administrative leadership with high performance by all parties in the economic unit. There is an increasing focus on the level of process performance in order to achieve perfection or what is known in operations and production management as zero defects. The sources indicate that Six Sigma emerged from the development of total quality management and is considered one of its tools. It represents an evolution in the methods and approaches used to improve quality and efficiency. Six Sigma is seen as a collection or accumulation of advanced quality principles and practices in the fields of management, statistics, and engineering, which have matured significantly during the twentieth century. (Knowles, 2011:12)

## **2- Definition of Six Sigma**

There have been many definitions of the Six Sigma technique. Below are some of them:

Chase defined it as a statistical approach that identifies errors in processes and then eliminates them (Chase et al., 2003: 2). It is also defined by Welch (2003: 2) as a philosophy of eliminating defects or errors through practices that emphasize understanding both measurement and improvement processes, relying on a statistical concept to reduce standard deviation or variation.

I also knew that it is: a strategic approach to increase profitability and market share, and to satisfy the customer by using a set of statistical tools that lead to profits and gains, which are represented by providing products or services in large quantities and high quality (Park, 2003:1). Both Pyzdek (2003:34) and Hilton (2009:518) referred to Six Sigma as a problem-solving methodology that is actually the most effective methodology for solving business problems and improving organizational performance. Hilton (2009:518) also stated that Six Sigma is an analytical method aimed at achieving the closest ideal results in production processes. Zhang, Hill, and Gilbreath (2009:10) defined Six Sigma as a measure of defect rate and as a method, program, philosophy, or set of tools and techniques aimed at improvement. Some have defined it as a comprehensive methodology that provides measurement tools for problem-solving (Bin, 2015:6). The researcher agrees with the definition that states that Six Sigma is one of the techniques and tools of total quality management that works on the synergy of all management levels in the economic unit, aiming to improve processes, focus on the customer and their needs, and attempt to provide defect-free products or services with a perfection rate of 99.9997%, with an average of 3.4 errors per million opportunities (Pyzdek, 2003:3).

## **3-Phases of Six Sigma**

There are five basic stages to be adopted in the application of Six Sigma, which is called a model, which is an abbreviation of the following words, which represent the five stages of the application of the technique (definition, measurement, analysis, analysis).

Improvement, Oversight) Details: (Knowles, 2011:15)

- A. Definition: It represents the first step in the implementation of the technology, during which the leader of the hexapod team selects the project, sets the initial goals, develops project standards, and analyzes the costs of poor quality for current project operations, as well as estimates or guesses them for new operations. During this step, problems are identified, their causes and importance are



determined in relation to the application of the quality standard, and customer requirements and needs are identified through personal interviews or distribution of questionnaires.

- B. Measurement: This step is one of the most important steps in the implementation of the technology because it requires collecting data and information for the purpose of understanding the causes of the problem and focusing on the most important of these problems.
- C. Analysis: During this stage, the roots of the problem that were identified and measured during the first step of the technology implementation are recognized. Then, suitable tools are used to detect the relationships and main causes of the problem in order to identify the statistical methods that help analyze these causes.
- D. Improvement: This step involves addressing errors and problems and improving performance after diagnosing errors and identifying their causes. Improvement is done by focusing on a range of activities that contribute to the process of improving performance, upgrading economic unity and eliminating activities that do not add value.
- E. Oversight: The oversight is to confirm that the improvements that have taken place have contributed to resolving the problem, as well as to ensure that the overall objective of the economic unit is achieved.

#### **4-Features of the Six Sigma Tolerance Application**

The technical features of the Six Sigma tolerance include:

- A. Identifying the desired product characteristics by the customer.
- B. Classifying the characteristics into models based on their level of importance.
- C. Determining whether the classified characteristics are controlled in the relevant operation.
- D. Determining the maximum allowable variations for each classified property.
- E. Determining the process variation for each classified property.
- F. Modify the design of the product, service, or process in order to achieve performance that aligns with the principles of Six Sigma tolerance. (Goetsch & Davis, 2010: 504)

### **Thirdly: Quality of Banking Services**

#### **1- The Concept of Banking Services**

Today, the competition among banks has become based on the diversity of services provided to customers or on innovation and renewal. Therefore, the importance of the concept of quality of banking services has emerged as a competitive strategy that allows banks to differentiate themselves from other competing banks, and this is one of their top priorities.

It is defined as the result of interaction between customers and the bank, and it is measured by customer standards according to their perceptions and expectations. It is also defined from another perspective as a set of processes, as well as being described as a "set of intangible elements that prevail over tangible elements, which individuals and institutions have left through their significance and utility value, which satisfies their financial, future, and credit needs, and becomes a source of profitability for banks through the mutual relationship between the two parties.

#### **2- The concept of quality in banking services.**

means the bank's ability to respond to customers' expectations and requirements, or to exceed them. Through quality, banks strive to support their competitive ability by providing excellent services that enhance the bank's position and status in the target market. Additionally, the quality of banking services is defined as satisfying customers' requirements and studying the bank's ability to identify these



requirements and meet them. If a bank adopts a process of providing high-quality services, it should seek to exceed customers' requirements (Evans & JR, 2003:9).

### **3- Dimensions of quality in banking services.**

The basic dimensions of quality in banking services are measures to assess the quality of banking services, which consist of five dimensions for evaluating the quality of banking services, namely: (Berry & Parasuarman, 2005:34)

- A. Reliability and Dependability: It means the commitment to provide services according to the specified deadline and in an independent and accurate manner, i.e., it represents the stability of performance.
- B. The tangibility represents the physical facilities and material resources used in providing the service, equipment, and the appearance of the employees at the service location.
- C. Responsiveness: It refers to the bank's ability to provide quick service and develop it, manifested in the readiness and willingness to assist customers.
- D. Security: It means transferring trust and security to the customer, maintaining the confidentiality of their transactions, financial security, and honesty in dealings.
- E. Empathy: It means good communication, caring for customers, understanding them, and taking care of them.

### **4- The importance of service quality**

The importance of banking service quality is characterized by a set of points as follows:

- A. Encouraging initiatives and proposals that would develop and improve work methods in banks.
- B. Increasing customer satisfaction rates.
- C. Achieving a suitable work environment that encourages creativity and innovation, and increasing performance and services.
- D. Saving time and effort in completing work and developing and simplifying work procedures for customers.
- E. Creating satisfaction among employees on one hand and customers on the other hand by clarifying the required tasks for both parties.
- F. Facilitating the measurement of customer performance according to clear and accurate standards.
- G. Total Quality Management leads to cost reduction and increased profitability for banks.
- H. Enabling banks to study customer needs and fulfill them.
- I. Working on improving the quality of the final product or service.

### **5- Quality features of banking service**

(Jurenviciie & Skvarciany) believes that the quality of the banking service has some advantages as follows: (Jurenviciie & Skvarciany, 2013:32-36)

- A. Improved quality of services provided by banks.
- B. Increase the level of performance of bank employees.
- C. Reduction of service and operating costs.
- D. Promoting the improvement and development of banking methods and methods
- E. Increased loyalty and affiliation among bank workers assisted by the provision of the highest level of service.
- F. Give bank workers incentives as a result of their efforts to carry out their work.



## **6- The relationship between the implementation of the Six Sigma and the quality of achieving banking service.**

In recent years, the popularity of Six Sigma has been growing significantly in the field of service economic units (service institutions), especially in banks, financial services, hospitals, hotels, air transport, public utilities, and others (Antony, 2004: 1008). These units have realized the benefits that can be achieved by applying this technique, especially after its remarkable success in the manufacturing industries. However, the regulatory functions or tasks in the service field are different from those in the industry, as they are fundamentally based on customer requirements and their quick response to the services provided to them. When a customer receives a service, their satisfaction or dissatisfaction is generated as a result of the direct interaction between the service provider and the customer, compared to industrial units where the product interacts with suppliers.

Additionally, the Six Sigma strategy in industrial units is based on a consistent foundation of quality management programs and process standards, while there is difficulty in developing and implementing quality standards in service units, as most of these units operate between a level of (3.0-1.5), meaning that defects or errors range from 455,000 to 66,800 defects or errors the reason for that is due to the fact that service units were ignored when efforts were made to improve quality, which focused more on industrial units. Since the development of the Six Sigma technique in Motorola and General Electric, it has been applied in many business sectors and has achieved great success not only in manufacturing but also in services. Although Six Sigma was originally designed to control industrial processes with a significant engineering aspect, which may not seem suitable for service units, many service units often suffer from cost inflation and a decrease in customer service levels. It is possible to make improvements to them to meet customer requirements and achieve satisfaction (Hassan, 2012:90). Through General Electric's efforts, it has been concluded that Six Sigma methods can be applied to any process that produces defects or non-conforming products. Therefore, without a true understanding of this technique, some may imagine that its application is not suitable for service units. However, the actual reality proves otherwise. Service units that have previously invested or are currently investing in Six Sigma projects save millions of dollars per project.

Despite the basic reliance of service units on performance, behaviors, and individual decisions that are achieved through the actual implementation of operations, analyzing and adapting human performance in this environment is difficult or complex. However, service units have discovered that the Six Sigma technique can be applied by focusing on activities and processes during their performance. Through this, identifying error sources and making necessary improvements can be done while ensuring their non-recurrence. Where the creation of value in service units occurs when the employee or service provider interacts with the customer, the unit is heard to achieve significant financial and operational improvements.

### **Fifthly: The practical aspect**

#### **1- A brief historical overview of Gulf Commercial Bank**

Gulf Commercial Bank is one of the private banks operating in Iraq, established as a joint stock company under certificate of incorporation number 7002 dated 20/10/1999 issued by the Companies Registration Department, in accordance with Law No. 21 of 1997, with a paid-up capital of 600 million Iraqi dinars. The bank commenced its comprehensive banking operations on 1/4/2000 through its main branch, after obtaining a banking license from the Central Bank of Iraq under license number 9/3/115 dated 7/2/2000. The bank's articles of incorporation have been amended several times, increasing its capital starting from 2000 until 2015, where the bank's capital reached 300 billion Iraqi dinars in 2015.





The bank's management has been keen to expand its activities geographically, both within and outside the country, by adopting an expansion plan in the coming years to increase the number of its branches spread throughout Iraq from 24 branches to 50 branches inside and outside Iraq (Annual Report of Gulf Commercial Bank 2015).

## 2- Research Community and Sample

The research community is represented by Gulf Commercial Bank, and the research sample consisted of the concerned bank employees. A total of 30 questionnaires were distributed to the employees, and we received 25 completed questionnaires, out of which 20 were valid for analysis and 5 were invalid, with a response rate of 60%.

## 3- Data Collection Tool

A questionnaire was used, designed based on relevant studies and scientific references related to the research topic, as a tool for collecting data for this research. The questionnaire was validated by some experts in the bank to ensure its ability to achieve its objectives. Through interviews and validation, the researcher found that the questionnaire has the ability to identify the possibility of applying the Six Sigma constraints in achieving the quality of banking service. The questionnaire consisted of two sections.

First Section:

A letter addressed by the researcher to the sample individuals, explaining the research objectives and scope, as well as collecting specific data about the sample individuals such as age, educational attainment, years of service in the department, and the number of training courses attended.

The second section:

It included the possibility of applying Six Sigma to achieve the quality of banking services, where it was divided into two axes, enabling the measurement of research hypotheses and including (16) paragraphs.

## 4- The method and statistical tools used in data analysis

Arithmetic mean - frequencies and percentages

## 5- Survey processing procedures

In the framework of survey processing, measures were defined to answer the questions using a Likert five-point scale, where the number (5) indicates strongly agree, while the number (4) indicates agree, and the number (3) indicates neutral, and the number (2) indicates disagree, while the number (1) indicates strongly disagree. In order to analyze the study sample individuals, the researcher categorized them into three levels as follows:

High impact if the arithmetic mean falls between (4-5), medium impact if the arithmetic mean falls between (3-3.99), and weak impact if the arithmetic mean falls between (1-2.99).

## 6- Analysis and discussion of research results and hypothesis testing.

Table 1: Demographic data for research as follows:

Table 1 Demographic data for research

Academic achievement			years of experience			Academic achievement		
ratio	repetition	Data	ratio	repetition	Data	ratio	repetition	Data
60%	18	Accounting	17%	5	from 5-10	10%	3	Diploma
20%	6	Department	23%	7	from 11-16	7%	2	Bachelor
13%	4	Economy	27%	8	from 17-20	33%	10	MA



7%	2	Count	33%	10	from 21 and over	50%	15	Ph.D.
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distribution of the first axis of Table 2 shows the computational medium and iterative the research (Six Sigma)

Rep	Paragraphs	Measurement	Strongly agreed	Agreed	Neutral	Don't agree	Strongly disagree	The arithmetic medium
1-	The bank has sufficient financial resources to implement modern methods that improve the quality of the services provided.	repetition	9	5	1	3	2	4.5
		ratio	18%	7%	3%	9%	7%	
2-	The management supports programs to improve the quality of the banking services provided.	repetition	8	6	0	2	1	4.01
		ratio	28%	20%	0%	6%	3%	
3-	Banks are equipped with modern devices and advanced technology to perform work quickly and accurately.	repetition	15	8	0		2	4.01
		ratio	50%	28%	7%	10%	7%	
4-	Banks use programs to improve the quality of the services provided.	repetition	18	6	0	2	4	4
		ratio	57%	20%	0%	7%	13%	
5-	There is a focus on using continuous improvement programs for banking activities.	repetition	14	7	1	5	3	3.8
		ratio	48%	23%	3%	17%	10%	
6-	Employees at various managerial levels are trained in quality service improvement programs.	repetition	15	8	0	3	2	4.01
		ratio	50%	28%	7%	10%	7%	
7-	Employees are selected and appointed based on experience, efficiency, and scientific knowledge.	repetition	20	5	0	3	2	4.02
		ratio	66%	7%	0%	10%	7%	
8-	Incentives and motivational rewards are provided to outstanding employees in their performance of their duties.	repetition	9	5	1	3	2	4.02
		ratio	18%	7%	3%	9%	7%	
	General average							4

Table 3 shows the computational medium and iterative distribution of the second axis of the research. (Quality of banking service)





Rep	Paragraphs	Measurement	Strongly agreed	Agreed	Neutral	Don't agree	Strongly disagree	The arithmetic medium
1.	The bank provides effective communication channels to its customers in order to determine their satisfaction level with the provided services and their suggestions for improvement.	repetition	20	5	0	3	2	4.2
		ratio	66 %	7%	0%	10 %	7%	
2.	Adequate data and information about the provided banking services are provided to customers.	repetition	14	7	1	5	3	3.89
		ratio	48 %	23 %	3%	17 %	10%	
3.	Banks provide effective means of communication with their customers in order to enhance their satisfaction level with the provided services and their suggestions for improvement.	repetition	15	8	0	3	2	4.01
		ratio	50 %	28 %	7%	10 %	7%	
4.	Adequate data and information about the provided banking services are provided to customers.	repetition	16	9	1	1	4	4.1
		ratio	53 %	30 %	3%	3%	13%	
5.	The employee moves to another location other than their workplace in order to clarify some ideas to the customers.	repetition	14	7	1	5	3	3.8
		ratio	48 %	23 %	3%	17 %	10%	
6.	The employee deals with more than one customer at a time, mostly in one go.	repetition	15	8	0	3	2	4.01
		ratio	50 %	28 %	7%	10 %	7%	
7.	The employee deals with customers lining up in orderly queues.	repetition	20	5	0	3	2	4.02
		ratio	66 %	7%	0%	10 %	7%	
8.	The bank management provides genuine supportive guidance to the customer.	repetition	9	5	1	3	2	4.2
		ratio	18 %	7%	3%	9%	7%	
The overall average.								4.02

**From table (2) and (3) we note the following:**

- A. Most of the sample members agree that Gulf Commercial Bank should analyze its qualitative needs based on job requirements, with a percentage of agreement reaching 87%, while the percentage of disagreement is 12%.



- B. The arithmetic mean of the first axis is 4, which is higher than the hypothetical mean of the research, which is 3. This indicates that the sample members support it to a high degree.
- C. Most of the sample members agree that the ability to apply Six Sigma constraints contributes to achieving the quality of banking services, with a percentage of agreement reaching 89%, while the percentage of disagreement is 10%.
- D. The arithmetic mean of the second axis is 4.02, which is higher than the hypothetical mean of the research. This indicates that the sample members strongly support the possibility of applying Six Sigma constraints to achieve the quality of banking services. Based on the above, it is possible to accept the research hypothesis, which states that "the Six Sigma constraints approach leads to reducing the costs of service quality provided in Gulf Bank while maintaining the provision of the best banking services."

### **Sixthly: Conclusions**

- 1- The Six Sigma is one of the techniques or methods that has achieved great success and widespread use in the twentieth century. The main reason for this is the focus of this technique on customers and their needs, and the attempt to provide products or services that are completely free from defects and errors that accompany operations in the economic unit. This technique requires directing all efforts towards improving processes, reducing time, as well as minimizing errors and deviations. It also requires increased attention from management at all levels to ensure successful implementation.
- 2- The Six Sigma technique is known as one of the tools of Total Quality Management that requires the collaboration of all managerial levels in banks. It aims to improve unit operations, focus on the customer and their needs, and attempt to provide products or services that are completely free from defects and errors, with a perfection rate reaching 99.9997% or 3.4 errors per million opportunities.
- 3- The Six Sigma (SS) technology was primarily designed to suit banks due to the fact that the operations of these units often exhibit a standardized pattern. Therefore, once the error or defect at a certain level is identified, the necessary measures are taken to improve it, resulting in products with fewer defects. However, in the field of services, the interaction between service providers and customers is subject to human dimensions that cannot be described as standardized and repetitive. Nevertheless, service units have managed to apply this technology and adapt it to an environment that focuses on the customer.
- 4- The results have proven that Gulf Commercial Bank has the potential to adopt the Six Sigma (SS) technology, as the survey distributed to branch managers and bank departments indicated that the bank meets, by 74.7%, the five implementation requirements, which include support and commitment from top management, continuous improvement, human resources and training, operations and systems, performance measurement, and incentives.
- 5- There is little knowledge of the Six Sigma technology. In order to identify errors in banking and standard operations, then upload their causes and suggest that they be addressed, bank management needs to further define this technique for the managers and employees of the bank and indicate the importance of adopting it as one of the modern management tools that contribute to the development of the work and the realization of a range of benefits for the bank and its management.

### **Seventhly: Recommendations**

- 1- Developing administrative work in banks and getting rid of traditional methods, adopting modern administrative mechanisms and techniques that contribute to improving administrative work and supporting developmental management projects.



- 2- Paying attention to defining the administrative levels within the unit using the Six Sigma technique through holding conferences, seminars, workshops, and utilizing specialized trainers to train employees on the application of the technique and distributing roles among them.
- 3- Adopting the application of the Six Sigma technique in banks seeking to improve and develop their operations, whether at the unit level or at a specific department within the bank, due to the numerous benefits of this technique, such as increasing unit profitability, reducing costs, and improving its competitive position, by relying on successful experiences that have adopted the application of the technique in various sectors.
- 4- Paying attention to employees and involving them in some decisions, as well as training them on modern administrative techniques to enhance their skills, in addition to providing material and moral incentives to maximize their loyalty to the bank and make them aware of their importance by the management.
- 5- Implementing a fair incentive system that rewards employees according to their performance at work within the bank.

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