

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

(وَتَرَى الْجِبَالَ تَحْسَبُهَا جَامِدَةً وَهِيَ تَمُرُّ مَرَّ السَّحَابِ صُنِعَ اللَّهُ الَّذِي أَتَقَنَ كُلَّ شَيْءٍ إِنَّهُ خَبِيرٌ بِمَا تَفْعَلُونَ)

الآية (88) سورة النمل

عن أم المؤمنين عائشة رضى الله عنها أنها قالت: قال رسول الله صلى الله عليه وسلم

" إِنْ لَمْ يَكُنْ يَجِبُ إِذَا عَمِلَ أَحَدُكُمْ عَمَلًا أَنْ يُتَّقِنَهُ . "

أخرجه أبو يعلى والطبراني

Dedication

To the soul of my father

To my mother, brothers, wife, daughter, sons, and grandsons

To those who supported me to accomplish this work

To those who are seeking excellence in their performance

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(الحمد لله رب العالمين)

Abstract

The objectives of this study is to provide evidences that Six Sigma is an appropriate method for quality management in diagnostic radiology departments by proving that the methodology is effective in achieving acceptable results of defect reduction, cost reduction, good return of investment (ROI) and customer satisfaction. The study also provide evidences that the results achieved by six sigma compared to traditional quality approaches were superior.

The research methods were based on an empirical study of implementing Six Sigma model of quality in Madinat Zayed Hospital Radiology Department. Five Projects have been selected on critical to customer bases and typically represents quality problems in radiology. The Six Sigma approaches of (DMAIC) define measure, analyze, improve, and control and (DFSS) design for Six Sigma were adopted in solving the quality problem. The results obtained from the empirical experience were discussed analyzed and benchmarked with results from other quality models done on similar healthcare institutions.

The first project is about Computerized Tomography (CT) and Ultra sound patient flow improvement is customer satisfaction, cost reduction and a cycle time reduction type of improvements. The results are an increase in CT scanning throughput by 30% and in US throughput by 35%, a reduction of 53.4% and 45% in the process time for CT and Ultra sound simultaneously is achieved. The result from the second project which is, the Report Turn- around Time R.T.T. initiative, is a reduction in reporting time from 72-hour to 18-hour (87.04%) reduction. The third project was on trans-vaginal Ultra sound (TVs). It is a cycle time, customer impact improvement. The process level improved from 2.5 sigma to 3.5 sigma

The fourth project was on film rejects. It was multi phase, employee and customer satisfaction, defect reduction, cost impact improvement project. The process improved from 3.72 sigma level (Base line process level) to 4.1sigma in first phase and 4.38 sigma in the second phase. The fifth project is a defect, customer impact project on request form writing. The process was working in around 1.45 sigma level post improvement resulted in 2.7 sigma level process.

The results achieved met the goals, and exceeded the expectations in some projects. Results show that the completed projects produced net annual savings of all running projects of UAE DH 1.2 million Return of Investment (ROI). In addition to the improvements in radiology department performance, there is a reduction in the customer's complaints rate. The model has become a trend and has gained wide acceptance in various hospitals in Abu Dhabi Health Authority.

ملخص البحث

الغرض من الدراسة هو إثبات مدى ملاءمة مصفوفة سيجما 6 (--) لتحقيق الجودة في أقسام الأشعة للتصوير الطبي لأغراض التشخيص ، والتي تتركز أهدافها حول تجويد الأداء، وتحقيق نتائج صحيحة في الوقت المناسب بأساليب صحيحة، وتكلفة أقل لتحقيق التميز وإرضاء المستفيدين من أطباء ومرضى وغيرهم . كما تهدف إلى أفضلية المصفوفة وتميزها على أنظمة الجودة التقليدية في تحقيق مستويات عالية للجودة .

طريقة البحث تقوم على التجربة العملية لمصفوفة سيجما 6 في قسم الأشعة بمستشفى مدينة زايد وذلك بتنفيذ خمسة من مشاريع تحسين الجودة وهي تمثل نماذج للمشاكل التي تواجه الجودة في أقسام الأشعة وتعتبر ذات حساسية للمستفيدين من خدمات الأشعة. وقد تم استخدام منهجية سيجما 6 (DMAIC) و (DFSS) في تعريف وقياس وتحليل المشاكل، وتحسين ومراقبة استدامة الحل لمشاكل الجودة. ومن ثم قراءة النتائج وتحليلها ومقارنتها بالمؤسسات التي تم تطبيق مصفوفة سيجما 6 فيها ومقارنة مستويات الجودة التي تحققت من تطبيق سيجما 6 و ماتحقق من جودة عن طريق أنظمة الجودة الأخرى التي طبقت في مؤسسات مشابهه وذلك للتدليل على ملاءمة المصفوفه للاستخدام لأغراض إدارة الجودة في أقسام الأشعة التشخيصية.

المشروع الأول يختص بكيفية زيادة عدد حالات الأشعة المقطعية والموجات فوق الصوتية ويهدف إلى إرضاء العملاء و تقليل التكلفة إضافة إلى تقليل زمن الممارسة العمليه وكانت النتائج كما يلي: زيادة في عدد حالات الأشعة المقطعية تعادل 30% ، و زيادة في عدد حالات الموجات الصوتية المنجزة تقدر ب35% ، تقليل في زمن عمل الأشعة المقطعية بمعدل 54.3% و 45% زمن أقل للموجات الصوتية و في المشروع الثاني تم تقليل زمن تقرير فحص الأشعة من 72 إلى 18 ساعة (87%) بإدخال إستخدام التقرير الإلكتروني. أما في المشروع الثالث فقد تم تقليل زمن الفحص المهلبى بالموجات الصوتية من مدى زمنى (20-25) دقيقة إلى مدى زمنى (5-15) دقيقة، وبذلك تم رفع مستوى الجودة من سيجما 2.5 إلى سيجما 3.5 . في المشروع الرابع وهو مشروع متعدد المراحل تم تخفيض عدد الأفلام غير الصالحة للتشخيص في المرحلة الأولى إلى 1.41% ثم إلى 0.2% في المرحلة الأخيرة ، وبذلك إرتفع مستوى الجودة من سيجما 3.7 إلى سيجما 4.38 . المشروع الخامس هدفه تجويد كتابة طلب فحص الأشعة . تم تحديد مستوي الجودة الأبتدائى ب سيجما 1.45 قبل التحسين , إرتفع بعد التحسين إلى سيجما 2.7 .

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Abbreviations

BB	Black Belt
C&E	Cause and Effect
CEO	Chief Executive Officer
CQI	Continuous Quality Improvement
CT	Computerized Tomography
CTQ	Critical to Quality
DMAIC	Define, Measure, Analyze, Improve, and Control
DMADV	Define, Measure, Analyze, Design, and verify
DFSS	Design for Six Sigma
EFQM	European Foundation for Quality Management
FMEA	Failure Mode Effect Analysis
GB	Green Belt
IDOV	Identify, Design, Optimize, and Validate
ISO	International Standards Organization
JCAHO	Jointed Committee for Accreditation on Healthcare Organizations
PACS	Picture Archive Communication System
MRI	Magnetic Resonance Imaging
MBB	Master Black Belt
PPM	Part per Million
QA	Quality Assurance
QC	Quality Control
QI	Quality Improvements
QFD	Quality Function
RTY	Rolled Throughput Yield
SIPOC	Supply Input Process Output Customer
SS	Six Sigma
TQM	Total quality Management
VOC	Voice Of Customer
UAE	United Arab Emirates
USA	United State of America