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Improving the Quality of Health Care Systems based on IT Applications

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Abstract

To reduce the burden on health care services there is a growing demand to find alternative non-traditional approaches to manage patients. Healthcare systems make effective use of IT applications to deliver health care to the human community. However, they are limitations in meeting quality constraints. Traditional techniques have ignored the performance and scalability aspects. IT divisions related to health care face challenges related to timeliness and accuracy. Thus besides delivering the required functionality at affordable cost, the IT applications have to deliver the product by keeping in view performance and security parameters**.** This paper provides end-to-end quality for successful deployment of health care applications.

Keywords: Electronic Health record systems, Quality of services, Continuous quality improvement, Quality management.

1. Introduction

The healthcare industry benefits by adopting techniques from Information technology within healthcare organizations. Taking care of health is now becoming complex and highly dynamic. Today, as the Information technology advances, the usage of clinical information systems like electronic health record systems (EHRs) provided better convenience for health care and reduced the occurrence of medical errors.

However, there are various security and quality concerns that can have a major impact on successful delivery of health care applications. Quality of care and decision making quality may have adverse affects if the application is relied on inaccurate data. One of the crucial aspects for the successful deployment of the real-time health care monitoring applications is end-to-end QoS .For successful deployment of health care applications, providing end-to-end QoS is a crucial aspect. The timeliness of the care or response given to the patient is also a major critical aspect in determining the quality. In that, it requires the data generated from the health care sensors to be collected, transmitted (via the network), processed, analysed, and used/acted on in a timely manner. For data processing, analysis and usage. However, end-to-end QoS assurance for such applications is a challenging task because of the presence of several factors that may affect the end-to-end QoS of health care applications. For instance, the Internet path between the home gateway and the cloud (where the application is deployed), and the path between the cloud and the health care centre/worker. Emergency services should not be delayed in certain situations like network congestion, and burst packet losses and network jitter.

The following questions need to be answered for Real-time health care applications. The first question is how various QoS metrics have to be combined to give an entire view of the data flows across various

technologies such as cloud resources, big data software frameworks and sensors, and the second question is how QoS metrics be defined across network and cloud sides. In order to provide QoS for such health care applications, it is necessary to monitor the workload metrics such as volume of the data, velocity of the data, and types of search queries.

Ensuring the quality of health care and reducing medical errors are priorities for the future Healthcare systems. Therefore, in this paper, we aim to highlight ways to implement privacy measures and to improve the performance and quality of the health care system.

2. CURRENT CHALLENGES:

Today IT divisions of healthcare organisations face challenges in delivering cost effective IT solutions doing full justice to the three key parameters such as Performance, security and privacy, compliance. Many statutory regulations impact on IT solutions such as electronic health record, Real-time location system, remote monitoring tools, mobile health and pharmacogenomics sequencing.

2.1 Processes and models for quality improvement management:

Quality measurement and management project (QMMP) is a task force of system to deal with the context and framework for quality among caregivers, health care managers and others. There are two types of products are required to address this needs.

1) **A continuous quality improvement model**: It helps the hospitals to develop a top-down, organisation-wide commitments to quality management and improvement. Quality management for health care delivery (QMHDC) is the main model to deal with that needs for QMMP.
2) **A quality assurance model:** It utilises the review risk management and infection control within hospitals.

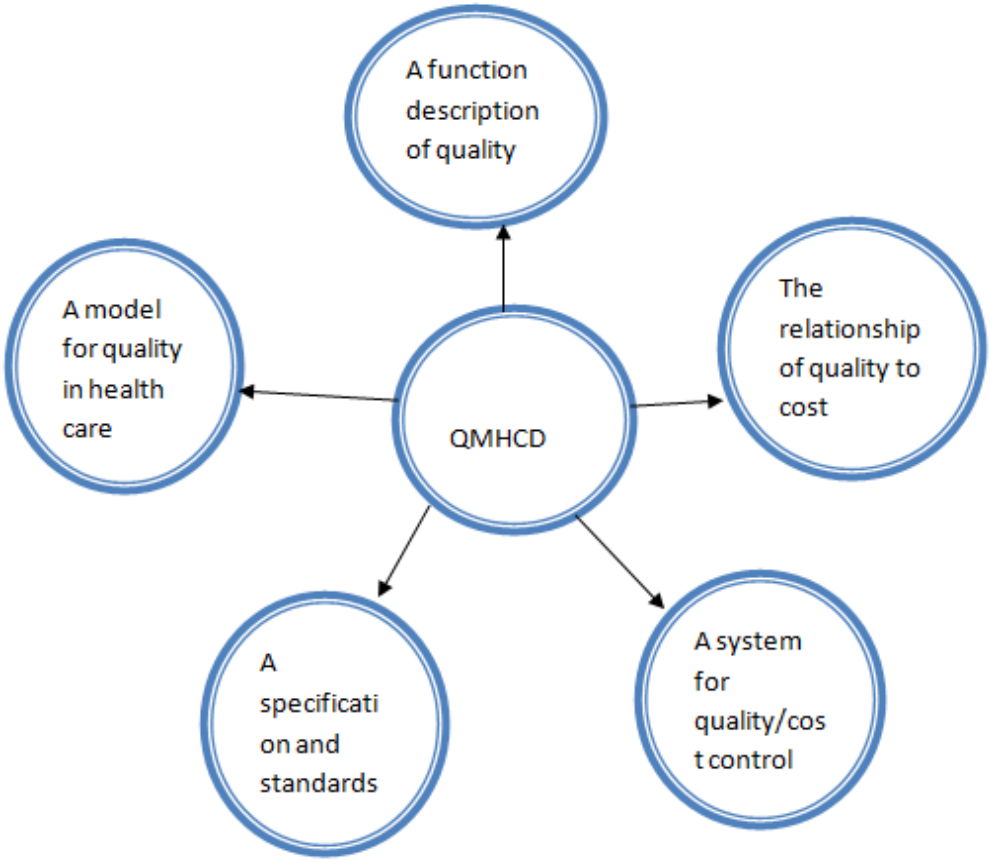

Figure 1: Five stages of Quality management for health care delivery framework

2.2 A functional description of quality: Based on CQI theory, quality may be described as individuals subjective evaluation of an output and the personal interactions that take place as the output is delivered to the individual. Quality has the main components for health care systems.

- **Content**: The Content quality is concerned with the medical outcome that is achieved for patients, payers and other health care professionals.
- **Delivery**: It reflects a individual customers interaction with the health care system for a patient.

1. Was the hospital clean?
2. Were the nurses cursing and informative?
3. Were services delivered rapidly, cheerfully and with understandings needs and preference?

2.3 The relationship of quality to cost: Quality relates to cost in five ways:

Quality cost	Low productivity	Optimalism vs maximalism	New technology	Preventive medicine and environmental health
It represents the resources required to fix a process's output when a quality failure occurs or, if the output is discarded, the resources that went into its original production. In addition to the direct costs of quality failure, it includes costs associated with lost business and management time spent dealing with dissatisfied Customers.	It occurs when two processes produce the same (desired) output, but one consumes more resources to achieve that end. The foundation of modern thinking about quality in health care notes that, within health care, low productivity does positive harm in that it wastes resources that otherwise could have profitably been employed for another patient.	The idea of cost-benefit analysis—if an additional unit of care brings only a small benefit to the patient, but costs a great deal, should it be used? Most physicians claim to be maximalists (maximizing benefit without regard to cost) but, in fact, function at some level as optimatists (balancing perceived benefits with cost). Cost-benefit measurements are very difficult, and can lead to troubling ethical questions.	It usually increases costs. However, it also usually improves the medical outcome that can be achieved. As with other industries, a better product sometimes carries a higher, but justifiable, cost.	They have been shown to be a very cost effective form of health care. The first two areas—quality waste and productivity—offer potential cost savings while quality is maintained or even improved. Some researchers believe that very significant cost savings could be achieved in these areas, ranging from 20 to 40% of total health care outlays.

2.4 A system for quality/cost control:

The principles of continuous quality improvement may be applied to achieve the highest possible quality at the lowest possible cost (high value care). The aim is to change the process so that quality failures do not happen, rather than fixing quality failures after they have occurred. A functional quality/cost management system answers three questions:

- Are we doing the right things?
- Are we doing things right?
- How can we be certain that it's done right the first time, every time?

2.5 Specifications and standards:
CQI extends the idea of 'standards' to that of 'specifications' based on 'quality absolutes'— Standards of 0% failures or 100% successes. That approach formally addresses several problems that quality assurance systems had to overcome with ad hoc solutions, and leads to a natural path from quality assurance to continuous quality improvement.

***2.6* A model for quality in health care:**
It can also elucidate relationships and interactions between important quality areas. The following critical areas of quality in health care are identified:
Quality of Management*:* Quality/cost control has been shown to depend almost entirely on an organization's control systems. These systems are designed and operated by management.
Quality of Delivery: Patients are our primary customers. It is therefore important to measure their health care expectations and strive to meet those expectations 100% of the time.

3. Conclusion
Quality improvement in health care today is going on at many levels, but is generally poorly coordinated. Organisations, practices, hospitals and insurers all have programs intended to improve quality but many of these programs overlap, and most are of marginal impact. This survey paper suggests the solutions to these problems: there are five key policy domains that needed to be considered: Standards, Quality of delivery, quality of management, value of care and quality/cost control represent the how the quality must be increased for a business applications and health care services on the top level. Based on IT applications, there are health care apps used to achieve the potential to enhance health care quality. Health care IT organisations leverages on the best of these processes and models by using QMMP framework for process improvement, Quality/cost, new technology, delivery leads to increase the efficiency of quality and also superior of quality**.**

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