

## Chapter 2

# Not Just Meaningful Data but Coordinated Data!

## Can Cloud Computing Promote Down-to-Earth E-Valuation of Disease and Healthcare?

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### ABSTRACT

*The era of data collection about health systems' performance is entering the new phase of timely and simultaneous access to diverse data sources in a systematic and coordinated approach. The concepts of harmonization and the measurement of the continuum of care have laid the ground for the pursuit of collecting, organizing, accessing, and sharing treatment and outcomes results. Service industries, faced with the need for access to multiple data sources, have adopted Information Technologies ranging from localized measurement of performance to regional monitoring of services, and finally into global networking via Cloud Computing. This chapter explores the benefits and challenges of Cloud Computing to the amelioration of medical and healthcare services given the idiosyncrasies of medicine and healthcare. A special focus is given to the extent of readiness healthcare systems manifest to measuring their performance, sharing the findings with patients and communities, and the accountability these systems demonstrate for the promises, implicitly or explicitly, they made about quality and safety of care. The implications of these promises in shaping patient expectations leading to patient and community evaluation of the healthcare services is a central theme running through this chapter.*

### INTRODUCTION

The purpose of this chapter is to discuss the critical role coordinated data about the provision of health care plays in defining the quality of that care. The title of the chapter suggests that while

data collection, analysis and evaluation is now part of medicine and healthcare, the coordination of these data requires a framework of data storage, verification, timely access, and availability to all providers of a patient's care. Cloud Computing is considered such a framework.

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Consider the analogy of the concept of coordination with that of a film pellicule (and I propose this at the risk of hearing all those born after the 1990s say, “*Film?* What is that?”) The pellicule has a length of hundreds of meters, and each frame captures a distinct aspect of what is being filmed. When the film is shot, one can inspect the frames either one by one, or, run the film and see it as a movie. I am basing this analogy on a statement made by Donabedian while teaching his class on quality of care at the University of Michigan, in 1984. He was reviewing the work of J.W. Williamson, especially his “health care accounting method” (Williamson, 1978) which not only stressed the idea of quality encompassing the continuity of care, but also indirectly that of care coordination. Donabedian said that it was like looking at the entire film pellicule, rather than single picture frames.

As I sat down to write, the memory of that class in Ann Arbor and the passing statement by Donabedian came back to me after 30 years, and I decided to build the thesis of this chapter around that imagery.

### **The Frame-by-Frame Inspection Mentality**

The first and systematic description of the dimensions of health care quality was by Donabedian (Donabedian, 1980). His trilogy of Structure-Process-Outcome gave health services researchers, clinicians, managers and policy makers the template upon which measures of quality were tested in the past four decades. While Donabedian did introduce the continuum of care into his thinking, it was mostly as a feedback loop where he mentioned that once patient’s health and disease needs are addressed, they will come back to the health care system with new needs, but also with expectations based on their previous encounters with the care system. However, the above trilogy was mostly operationalized as three distinct dimensions through measures of structure, measures of processes, and

whenever possible measures of outcomes. Most prominent measures took the shape of ratios or indicators (Kazandjian, 1991) and were focused on quantifying aspects of care delivery processes (Arah, 2006). Often these indicators were pilot tested using *de novo* collected samples of data to assess their validity, reliability and their usefulness. Once these were assessed, large scale data collections were initiated, worldwide.

Still, and within the analogy of a film pellicule, these indicators allow only frame-by-frame inspections. They do capture what happened at a point in time during the care process, but they are just that: a point in time during a continuous process. What was needed is a new framework, where the dots are joined into a line, or the film frames played at high speed to show the movie of care! And that movie, we have learned, can have a happy ending, be a tragedy, or have a bad script wasting large amounts of resources.

### **The Continuum of Care and Care Coordination**

Similar to original astronomical hypotheses of heliocentrism, many of the quality of care measurement approaches were *nosocomocentric*, or used the hospital as the center of the healthcare delivery system. Why? I propose three reasons relevant to the goals of this chapter:

1. The patients are “captive” in a hospital and to all that was done to address their disease needs;
2. That is where (i.e., hospitals) the doctors who used the expensive technologies practice; and
3. Emergency rooms, often used as primary care centers, are in or near hospitals.

There are certainly other reasons as well, many of them depending on the culture of a health care system. For example, a system with a well organized and accessible primary care centers and

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