Situated Big Data and Big Data Analytics for Healthcare

Mark Sterling
School of Science and Technology
Nazarbayev University
Astana, Kazakhstan, 010000
Email: mark.sterling@nu.edu.kz

***Abstract*—Big Data and Big Data Analytics are a set of emerging technologies that allow researchers, organizations, and businesses to draw actionable insights from large data sets. A primary source of such large data sets are those created in a healthcare or medical context. This can include data from, but not limited to, electronic health records, mobile applications (mHealth), diagnostic equipment, genomics, and social media. Consequently, Big Data technologies promise to have a transformative impact in healthcare, public health, and medical research, among other application areas. For example, researchers are already developing new standards, protocols, and study designs that are more suited mHealth interventions as opposed to the traditional randomized clinical trial. Also, the easy availability of data now allows population level studies at scales that were previously unimaginable. Although Big Data and Analytics have the potential to deliver significant benefits in healthcare applications, the full consequences of this technological shift are, as yet, unknown. The application of Big Data in healthcare is often viewed as an inevitability or technological imperative. This perspective discounts the role of human agency in a dangerous way. As a theoretical foundation, we review relevant ideas from the organizational communications literature and discuss theories of technology acquisition such as adaptive structuration. The notion of situatedness is explored with examples drawn from visualization, augmented reality, and cultural heritage.**

Due to significant interest, systematic literature reviews and meta-analyses on the topic of Big Data in healthcare are already available. These reviews help to delineate both the potential benefits and challenges in this area. In particular, we emphasize challenges with high human costs such as the privacy of patient data and the thoughtful design of technological interventions for at-risk populations. Lastly, we show how a situated perspective is a necessary tool in building next generation healthcare information systems.

978-1-5090-6046-7/17/$31.00 ©2017 IEEE