The Strengths, Weaknesses, Opportunities, and Threats Analysis of Big Data Analytics in Healthcare

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ABSTRACT

Improving the performance and reducing the cost of healthcare have been a great concern and a huge challenge for healthcare organizations and governments at every level in the US. Measures taken have included laws, regulations, policies, and initiatives that aim to improve quality of care, reduce costs of care, and increase access to care. Central to these measures is the meaningful and effective use of Big Data analytics. To reap the benefits of big data analytics and align expectations with results, researchers, practitioners, and policymakers must have a clear understanding of the unique circumstances of healthcare including the strengths, weaknesses, opportunities, and threats (SWOT) associated with the use of this emerging technology. Through descriptive SWOT analysis, this article helps healthcare stakeholders gain awareness of both success factors and issues, pitfalls, and barriers in the adoption of big data analytics in healthcare.

KEYWORDS

Big Data, Data Analytics, Data Breaches, Data Ethics, Electronic Health Records, Health Information Exchange, Health IT, Healthcare, Machine Learning, SWOT Analysis

1. INTRODUCTION

The US healthcare system has both strengths and weaknesses. It enjoys a large-scale, well-trained, and high-quality workforce of clinicians, nurses, and specialists, robust medical research programs, and the world’s best clinical outcomes in select medical services. Yet, it suffers from high expenditure, low performance, and disparity in health status, access to care, and outcomes of care (Barnes, Unruh, Rosenau, & Rice, 2018).

1.1. High Cost of the US Healthcare System

According to a recent report published by The Organization for Economic Co-operation and Development (2018), in 2017 the US spending on healthcare was the largest, measured by both the spending per capita and the percentage of the gross domestic product (GDP) among its 37 member nations. Figure 1 shows that the US spent over $10,000 per capita on healthcare that year, or about 17% of GDP.

Even more alarming is the rapid growth in US healthcare spending. According to the Centers for Medicare and Medicaid Services (CMS), healthcare spending is projected to grow at an average rate of 5.8 percent from 2012-2022, 1.0 percentage point faster than the expected average annual growth in the GDP. By 2022, US healthcare spending is projected to be nearly 20% of GDP (Centers for Medicare and Medicaid Services, 2012).

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1.2. Low Performance of the US Healthcare System

This extremely high spending is sharply contrasted with the low performance in the US healthcare system. In 2000, the World Health Organization (WHO) published a report that measured and ranked the health system performance of 191 countries. According to this report, the US healthcare system was unimpressively ranked at 37, below most industrialized countries including France, the UK, and Canada, and even below some less developed countries such as Colombia and Chile (Tandon, Murray, Lauer, & Evans, 2000). Almost two decades later, there has not been much improvement in the performance of the US healthcare system. According to a 2017 report from the Commonwealth Fund, the US is ranked last out of 11 high-income industrialized countries based on measures including care process, access to care, administrative efficiency, equity, and health outcomes (Schneider, Sarnak, Squires, Shah, & Doty, 2017). Figure 2 shows that the US healthcare system performs at the bottom on four of the five measures.

1.3. Efforts to Improve the US Healthcare System

In 2007, the Institute for Healthcare Improvement (IHI) launched the Triple Aim initiative to improve the patient experience of care (including quality and satisfaction), improve the health of populations, and reduce the per capita cost of health care. The Triple Aim initiative directly targets the critical measures of healthcare performance including both quality of care and efficiency of care (Institute for Healthcare Improvement, 2007).

In 2008, Congress enacted the Medicare Improvements for Patients and Providers Act (MIPPA). As part of the implementation of MIPPA, CMS introduced the value-based purchasing (VBP) plan linking payments directly to the quality outcomes of the care provided. This pay-for-quality or pay-for-performance plan aims to move away from the traditional fee-for-service plan which provides no incentives for the providers to improve care quality and contributes to the high cost of healthcare (Terhaar, 2018).

In 2010, to address the disparity and inequity in healthcare and to increase access to care for tens of millions of uninsured and underinsured Americans, Congress enacted the Patient Protection and Affordable Care Act of 2010, also known as “Obamacare” (“Patient Protection and Affordable Care Act of 2010,” 2010).

While healthcare initiatives, regulations, and policies may help drive the quality and performance improvement at the macro level, effective implementations require concerted efforts at the micro level by all stakeholders including policymakers, providers, payer, patients, and the public. In addition, these diverse stakeholders must be empowered and enabled by innovative solutions and technologies.
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