Promise and challenges of big data analytics in healthcare

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Abstract

Healthcare industry has traditionally been data intensive driven by record keeping needs for patient care, provider reimbursement, regulatory and compliance requirements. Although much of the data has existed in paper form, last decade has seen a major transformation leading to rapid digitization of records. Government health reforms are pushing for adoption of interoperable electronic health records to make stored data exchangeable, usable, searchable, and actionable by the healthcare sector as a whole. Major sources of healthcare data include clinical and administrative data from EHRs, data from registries, monitoring tools, wearable devices, social media, news feeds, and articles from medical journals among others. These massive amounts of electronic health data sets, referred to as "big data" in healthcare are complex, fragmented and difficult (or impossible) to manage effectively with traditional data analysis techniques and tools. By harnessing the power of big data analytical methods, there is tremendous potential to take advantage of the data explosion to deliver more effective patient care and reduce costs. Big data analytical methods leverage modern age computing horsepower, distributed processing and advanced visualization for processing real-time transactional, structured and unstructured data to discover associations, identify trends and patterns within the data to make better informed decisions and predictions. However, it is still an emerging healthcare field and several challenges must be addressed to accelerate its maturity and widespread adoption. These challenges include addressing privacy, security, and quality assurance concerns using available open-source platforms, addressing issues of data ownership, lack of standardization, and need for data governance.

Biography

Anjali Shah received her PhD in Biomedical Informatics from Rutgers University. She has served as Assistant Professor and Program Director in the department of Health Information Management at Temple University. She is currently a Visiting Scholar in the School of Health Related Professions at Rutgers University. She has over ten years of experience in software development in different industries including telecommunications, finance and health care. She has led and delivered several projects, including electronic health record (EHR) system at Rutgers School of Dental Medicine. Dinesh P Mital received his MS and PhD degrees from The State University of New York (SUNY), Stony Brook in 1970 and 1974, respectively. From 1980-1983, he worked as a Professor in the Department of Electronics and Computer Engineering, University of Roorkee, Roorkee, India. From 1983 to 1999, he worked as an Associate Professor, in the School of EEE, NTU, Singapore. Currently, he is working as Professor in Health Informatics at Rutgers University. He has published over 280 technical papers in various international conferences and journals.

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