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## Big Data

Big Data is a particularly exciting area for future research and commercial development in health informatics due to prediction and personalization. Development in the fields of biomedical and health informatics are driving major expansion in big-data, not only because of the sheer volume of information generated, but also due to the complexity, diversity, and the rich context of the data that encompasses discoveries from basic sciences to clinical translation, to health systems and large-scale population studies on determinants of health. This general trend also brings socio-legal implications. New data analytic tools to facilitate scalable, accessible and sustainable data infrastructure for effective management of large, multiscale, multimodal, distributed and heterogeneous data sets and convert data into knowledge for support cost-effective decision aids, disease management, and care delivery need to be developed. In promoting big-data as a source of innovation in healthcare and accelerating the translational pathways from the laboratory bench to the patient's bedside, this special issue includes a collection of papers addressing some of medical and health informatics challenges related to big data. Papers submitted cover a range of topics, from bioinformatics, imaging informatics, sensor informatics, medical informatics to public health informatics. They also include initiatives that enable use of big-data analytics in health systems for improved clinical decision making, enhanced efficiency of care provision, policy development and policy implementation." (1) . The decision making and prediction of diseases makes the big data and its analysis more exciting and valuable.

SMART and FHIR apps will play a crucial point in further development of using such data. They will act as the entry point to get and analyze data. FHIR represents clinical data as resources, where each resource is a coherent expression of meaning stated in terms of well-defined fields and data types. These resources constitute a graph of clinical data by explicit inter-resource references. Furthermore, the FHIR API is a contemporary, resource-oriented HTTP interface to search for, create, read, update, and delete FHIR resources representing clinical, administrative, and infrastructure data including single-patient queries and population-level queries. FHIR uses idiomatic XML and JSON to serialize resources which is a lot easier to ingest and analyze data especially in massive scales.

One particularly interesting new system in this area that has great potential and challenges it must overcome to achieve that potential is The Fast Healthcare Interoperability Resource which is a data standard that uses the same technology as the internet to enable the retrieval of health information. Instead of relying on document-based exchange. This is basically emailing pre-defined packets of static information back and forth between EHR systems. The

FHIR creates a unique identifier for every piece of information that anyone with a FHIR browser application can access. Every data element, or resource, gets its own standardized, shareable identifier that acts like the URL of a webpage. In the same way that they can access their favorite websites on the internet, any FHIR app user with access to the resource URL can engage with the information in certain ways, no matter what electronic health record operating system they are running on their device. FHIR apps act like web browsers do when connecting with the individualized URLs. Just like any browser that works with different operating systems, a FHIR app allows users running different EHR platforms to connect to the same data in the same manner. This approach eliminates the complex interoperability barriers rooted in proprietary data standards that have made it difficult to reliably scale up direct EHR-to-EHR data exchange (2), which is a great potential and helps build apps faster and more accessible.

I think FHIR will succeed and it is the spark that the healthcare industry needs to turn providers and vendors into true partners for patient care, and it may help to reduce the amount of head-butting that characterizes so many current vendor-provider relationships (2). As vendors embrace new technologies and a new outlook on their role in the EHR marketplace, and providers start taking advantage of new opportunities to retool their technology suites, interoperability may become less of an agonizing argument and more of a lesson in how to collaborate, innovate, and succeed in a deeply challenging environment via collecting data and analyzing it.

#### Work Cited

1. Joshua C Mandel, David A Kreda, Kenneth D Mandl, Isaac S Kohane, Rachel B Ramoni; SMART on FHIR: a standards-based, interoperable apps platform for electronic health records, *Journal of the American Medical Informatics Association*, Volume 23, Issue 5, 1 September 2016, Pages 899–908, <https://doi.org/10.1093/jamia/ocv189>
2. H. (2017, May 01). FHIR Finally Brings the Internet to Bear on Healthcare's Big Data. Retrieved November 05, 2017, from <https://healthitanalytics.com/features/fhir-finally-brings-the-internet-to-bear-on-healthcares-big-data>