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Data Overload Management

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The health industry will have 25 times increase in data by 2020. There is a need to manage the challenge of getting right data to right stakeholder at right time for best patient care outcome.

By 2020, through the mechanisms of personal health record (PHR), electronic medical records (EMR), case report form (CRF), electronic health records (EHR), genomics and other sources of patient data being digitized; and their interface and integration into enterprise data warehouses through interoperable hosted and federated services; quality clinical, biological, social, lifestyle, behavior, environmental and other patient health data will be a blessing and prerequisite for best patient care. Chronic diseases in different community cohorts, due to its social, economic and healthcare burden, will become unique life-science/healthcare laboratories that will provide the needed roadmap towards building the new paradigm of "*Learning Healthcare System*".

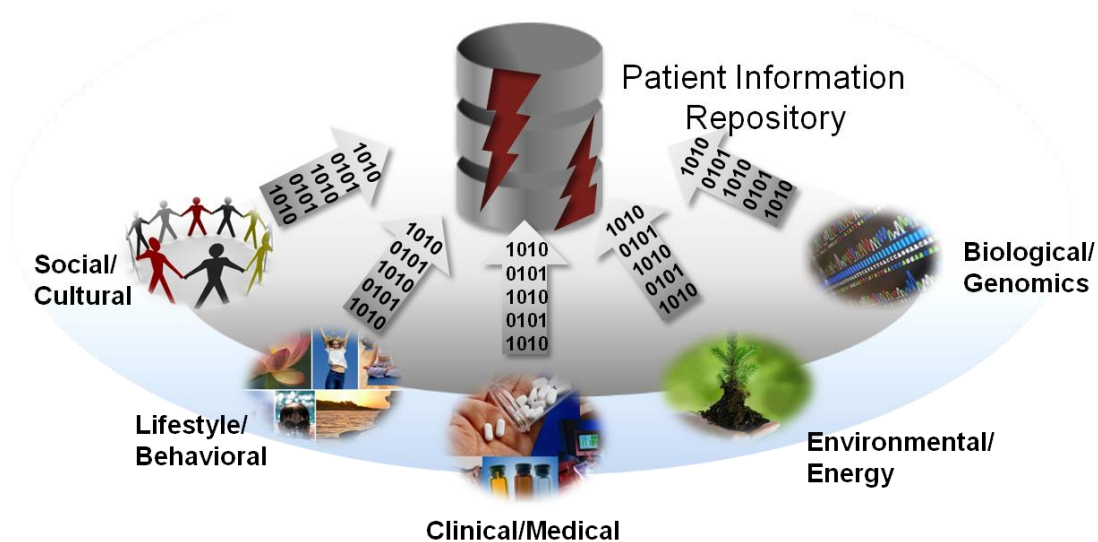


Figure 1: Patient Information Repository Drowning In Data By 2020

The challenge, then, is two-fold:

- Identify and access the right data from the massive amount of available data and siloed IT infrastructure
- Convert the data into meaningful and needed smart information by building inference algorithms/engine and analytics that train and guide patients, physicians, researchers, providers, payors, and other care support workers at the point of care to deliver best patient outcome

The Top 10 Goals include:

1. Define the right and accurate data sources for type of data; get data from the right people at right time for real time use; deliver the best care and continuity; acquire full episode data from patient, including patient experience; standard source of data from physicians and providers.
2. Minimize data normalization by collecting accurate, comparable and consistent data at the source; build longitudinal care data by cross-connecting silos between healthcare stakeholders.
3. Transform data into value-data (information, analytics and knowledge) for meaningful use that fosters shared accountability and decision-making in the continuity of care; move towards preventing new episode and emergency.
4. Identify, classify, and segment data that support population level prevention, patients with attack of disease, and patients in maintenance to improve overall outcome of care and ROI for the industry.
5. Identify, classify, and segment data that support up-stream public health awareness, surveillance, prevention, and epidemiology studies and down-stream clinical, translational, and comparative effective research; develop computable data that enhances clinical decision, quality assessment, effectiveness determination, and pharmacovigilance.
6. Build patient level individualized health information solution; develop filters that provide quality minimum data sets that are needed to build targeted and tailored treatment and genomic characterization; provide episode-specific patient treatment and outcome knowledge.
7. Simplify standards and adopt them through use cases from inception to implementation phases in a real care environment; integrate standards between knowledge and care process; develop common and standard data set through increased collaboration between public and private sectors.
8. Make Syntactic Interoperability (how information is used in a meaningful way) and Semantic Interoperability (standard vocabulary that gives the same interpretation of data integration) throughout HIE processes across the industry.
9. Integrate technology, such as mobile front-end devices, and process streamlining with information workflow and continuous education to provide a collaboration mechanism to patients, physicians, providers, payors, and health workers around quality common data for the best care.

- Build patient and population trust in data, information, and digital health community; establish disease-specific and cohort-specific social networks of industry stakeholders.

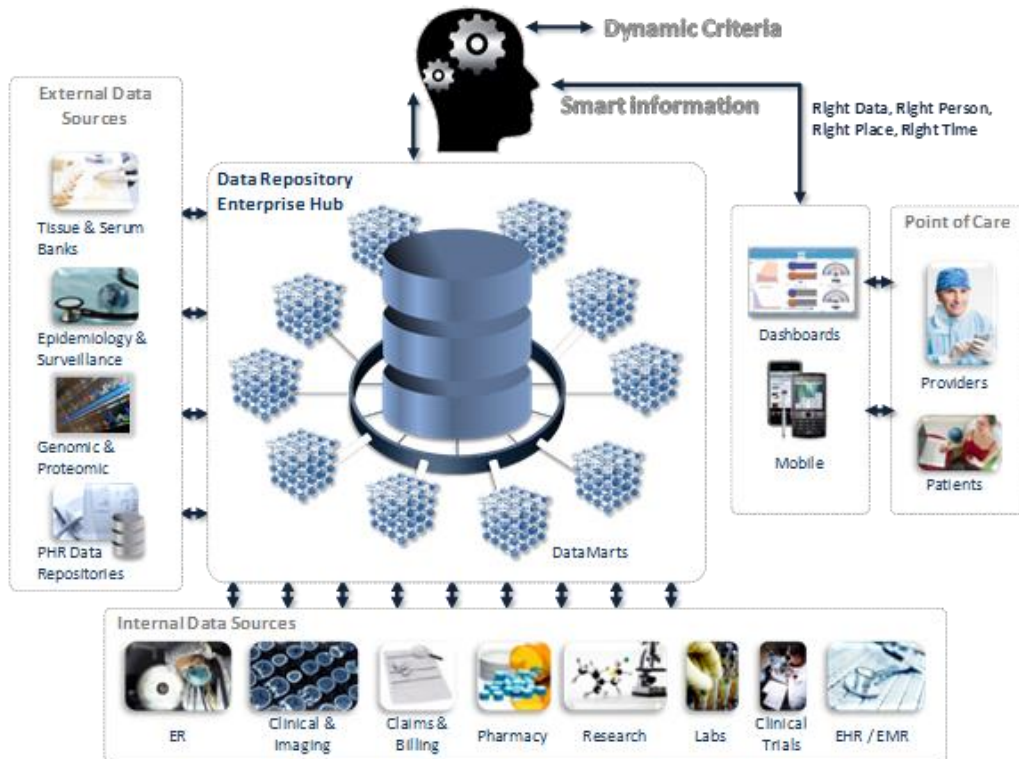


Figure 2: Inference Engine Based Smart Information

To manage the data overload, the IT community needs to develop new technology and effortless approaches to move data from patient experiences to care encounters to care management. They also need to provide user friendly tools for using information by providers, physicians, payors, and patients for public health and research purposes. All stakeholders must collaborate and work together in this process by leveraging a comprehensive electronic health infrastructure that will support the 2020 biomedical ecosystem, where care delivery and research will be synergistically integrated and all stakeholders of the community will support the enterprise.

Resulting meaningful, streamlined, applicable and targeted data will allow physicians to do real-time data-mining in support of care decisions and to see the outcomes of intervention strategies. The patients must be empowered to search treatment options, become fully informed of the alternative outcomes, and choose interventions that meet their personal needs. Support researchers will increase and accelerate enrollment in clinical trials and effectively establish a massive patient cohort without compromising privacy laws. Provide providers and payors will find real-time outcomes and cost analysis for disease specific interventions, including information that guides innovative strategies to decrease cost.

Having comparable, consistent, and continuous data flow to the right people at right time will speed up the building of a "*Learning Healthcare System*". It will utilize the platform of comprehensive electronic health infrastructure that supports integrated care delivery and research models. This health infrastructure will utilize appropriate data, information, and knowledge in a practice setting that integrates the diverse health information sources. It will connect to all of the participants of new health ecosystem and support the collection of patient reported outcomes. This information will connect to research infrastructure that permits the collection of unique patient information on a historical, clinical, environmental, social, and especially biological level in genomic and supports molecular analysis. It will drive the broader population in participating in basic, translational, and clinical research and personalized medicine.