

Health informatics



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Fundamentals of database characteristics and structure. Database is a collection of persistent data stored in structured manner that is used by the application systems of some given enterprise (Date, Kannan, & Swamynathan, 2010). Usually a database is shared by a number of users. Characteristics of database include large volume of data and certain tools those enable analysis and query of the data stored in a database.

Structurally a database consists of tables and each tables has records and to each record there is an associated field. The records show up as columns, fields show up as columns and each data in the table is called cell. Forms are designed by database designers to enable users to enter data in the database. Various types of medical data and information records relevant to this project. Human body comprises of numerous inter-related systems and each system is critical for having a healthy body. Furthermore, a doctor diagnoses ailments with respect to each system by assessing the medical data associated with that particular system, hence there is a range of medical data that is assessed. Key forms of medical data include (Szolovitz, 2002): i) Numerical data pertaining to various laboratory data, bedside measurements. ii) Physiological data like ECG, EEG, EMG, etc. iii) Imaging data like X-Ray, MRI, CT, Ultrasound, Pathology iv) Genetic data v) Historic and family data vi) Narrative data prepared by doctors and paramedical personnel Information records pertaining to this data includes patient records, medical records. Electronic forms of these records are relevant to this project. The importance of uniform terminology, coding and standardization of the data. Healthcare is a safety and a security critical domain. Safety and security of medical data can only be maintained if it is acquired, processed, stored and shared in a systematic and a structured

manner. Hence it calls for proper nomenclature, coding and standardization of the medical data. Systems like clinical vocabularies, coding systems are structured formats those enable error-free unambiguous care and treatment of the patient (Rogers, 2005). These terminologies (like SNOMED CT) and coding and standardization systems (like International Classification of Diseases) are facilitating development of healthcareIT standards like Health Level 7 (HL7) at global level and such standards are leading to the development of interoperable information systems in healthcare. Various information standards and organizations that may be applicable, and possibly required, for this project. Various forms of health information standards those may be applicable pertain to classifications, guides, practices, and terminology. Furthermore, there are identifier standards those enable flawless identification of patients, product, provider, Site of care etc. Communications standards pertain to message formats, these include DICOM (Digital Imaging and Communication in Medicine) and HL7, National Electrical Manufacturers Association (NEMA) is responsible for DICOM and ANSI is the organization that has accredited HL7. IEEE has been working on Medical Data Interchange Standard (MEDIX) and Medical Information Bus. Standards on content and structure are also underway, ASTM is the agency that is working on these standards. As far as clinical data representation is concerned, ICD-10 is the standard that has been developed by World Health Organisation. Laboratory Observation Identifier Name and Codes (LOINC) has been developed by group of pathologists and these codes are being incorporated into Unified Medical Language System (UMLS) that is being maintained by National Library of Medicine (Blair, 1999). Similarly there are standards those pertain to confidentiality, data security, authentication,

quality indicators, data sets and guidelines. Bibliography Date, C. J., Kannan, A., & Swamynathan, S. (2010). *An Introduction to Database Systems* (Eighth ed.). Delhi, India: Pearson Education. Szolovitz, P. (2002). *Introduction to Medical Informatics*. Retrieved May 16, 2011, from MIT Computer Science and Artificial Intelligence Laboratory: <http://groups.csail.mit.edu/medg/courses/6872/2003/slides/lecture2-print.pdf>

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