Slim-Prim: A Database for Biomedical Informatics to Support Translational Research

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Abstract

Slim-Prim, an integrated data system (IDS) for collecting, processing, archiving, and disseminating data from basic and clinical research, was developed in response to this challenge. Slim-Prim is accessed through user-friendly Web-based applications, removing the security risks associated with office or laboratory servers and increasing data accessibility. For institutional projects, Slim-Prim is a laboratory management interface and archive data repository. Importantly, de-identified data can be shared and analysed across research domains in a HIPAA-compliant manner thanks to multiple levels of controlled access. As a result, Slim-Prim fosters clinical and academic collaboration, which is crucial to the growth of translational research. Slim-Prim is an illustration of how IDS can be used to bridge the gap between laboratory discovery and practice and increase organizational efficiency.

Keywords: Bioinformatics; Health management; Clinical trial, Basic research; Laboratory management; Data sharing

Introduction

Clinical research and patient care can become more interconnected and interactive thanks to technology. Basic and clinical researchers collaborate on the interpretation and application of research data in clinical settings in what is known as translational science. Sharing data is essential for accelerating biomedical science's progress from the bench to the bedside to the community and improving healthcare quality. To go from clinical examination to local area practice, incorporated information frameworks should be made to permit local area scientists to get to get and classified research information without any problem [1]. After that, these data can be used to respond to questions that are relevant to particular communities and can be extrapolated to the national level. Moreover, data can be absorbed for local area training to assist with further developing medical services. To address information incorporation issues, the Logical Lab Data The executives Patient-care Exploration Data The board Thin Demure framework was created by the Biomedical Informatics Unit at the College of Tennessee Wellbeing Science Center [2]. The Public Foundations of Wellbeing NIH "Guide" recognized an absence of correspondence among fundamental and clinical researchers as a significant detour to the improvement of translational

seat to bedside innovations. The "Roadmap" emphasized the requirement for novel bioinformatics solutions to address this issue and promote collaboration between clinicians and basic scientists. The initial need at UTHSC to integrate data from basic science and clinical research prompted the development of the Slim-Prim system [3]. At the University of Tennessee, a growing number of clinicians and faculty members are utilizing the Slim-Prim system for their own research. Take a look at the Slim-Prim system's schematic overview.

Improvement of the thin demure framework: metadata

Metadata design is clearly the most important factor in producing effective query results, such as searching results, data grouping for integration, correct manipulation, and so on. In addition to handling data in a variety of formats and for data storage and retrieval, searching, sorting, and reporting, the attributes in the metadata are designed to contain all essential identification keys [4]. Names, descriptions, keywords, control vocabulary, data type, and other fields necessary for future mapping, integration, and navigation are included in metadata, for instance. The metadata table specifies the data type that is used to store the

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attribute values in the table. All the quality portrayals and values can likewise be connected along with related ID keys.

Tool for screening patients and research subjects

We've found that prospective subjects are more likely to use a website to learn about clinical trials and the requirements for enrolment than they are to use more conventional methods. The purpose of the patient recruiting and research subject screening tool is to pre-screen and validate subjects for research as well as inform and inspire potential participants. Potential subjects' data are stored and reported to data coordinators for validation and review [5]. The system provides subjects with a private questionnaire that meets the clinical investigator's predetermined criteria for prequalification. If the person does not meet the requirements for the study, they are informed right away. Recruiters have more time to speak with legitimate participants as a result of the Web application's ability to identify suitable subjects. In the event that they do qualify, the framework gives a rundown of preliminary locales, phone numbers, and a guide to the picked area.

Combining data from a variety of sources

Researchers can review data in accordance with their research design thanks to this. For instance, the Department of Health and Human Services' Healthcare Cost and Utilization Project (HCUP) provided 10 years' worth of triennial data from the Kids' Inpatient Database [6]. This data was then converted from ASCII to CSV and uploaded into the Slim-Prim system. Nearly seven million pediatric hospital discharges from patients with a variety

of diagnoses and comorbidities are represented by these data. In order to limit the data set, the Slim-Prim report system also allows complex queries. For statistical analysis using the user's preferred software, the data can be downloaded in Excel spread sheet format.

Discussion

It is abundantly clear that the clinical and translational research communities require a Web application that facilitates quick data sharing among laboratories and institutions and provides simple access to data. These tools need to be made with security and strict research compliance in mind; As a result, the Slim-Prim system's primary components include robust access levels. Slim-Prim makes scientific laboratory management easier and more effective by letting researchers customize their own applications to collect data in a variety of formats about lab materials, tools, and budgets [7]. For data collection, storage, retrieval, searching, and reporting, this system also makes use of patient-care information tools like online screening forms, online applications, medical forms, and patient folders that contain demographic, laboratory, and historical data. Importantly, the system's expandability and modularity make it possible to store data from a variety of fields, including rehabilitation data, DNA sequencing files, and radiology and image file data. The purpose of these scientific and patient-care informational tools is to make community research easier and to encourage collaboration with other researchers and communities.

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