

**Technology**

Clinical architecture for healthcare data repositories

Inventor

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Key Features

- Utilizes system biology approach to clinical architecture of data repositories
- Could enhance patient therapy
- Could enable the development of more sophisticated medical systems
- Additional uses in medical research and/or drug discovery

Stage of Development

Conceptual stage

Keywords

Software

- Clinical architecture
- Systems biology
- Medical records
- Polynomial
- Personalized healthcare
- Patient care

Patent Status

None

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Novel Architecture for the Computerized Patient Record Based on Modeling Physiology (VA Reference No. 00-084)

Unique polynomial hierarchical structure for healthcare data repositories that could improve patient care and reduce healthcare costs

Technology

The Department of Veterans Affairs has developed a novel architecture based on an object oriented modeling (OOM) of systems biology including the functional concepts of cell biology and human physiology. The architecture will greatly facilitate the development of more sophisticated medical systems by enabling development of general systems capable of decreasing medical errors, increasing patient safety and increasing the quality of patient care while also decreasing the cost of care across a wide spectrum of medical specialties.

Description

This architecture has been optimized for efficient data entry at the various functional points of the patient care process (examples include, clinical laboratory, radiology, and pharmacy). The current partitioning of the data within the medical record actually impedes the evaluation of care by distributing clinically related data throughout the paper or electronic patient record. This distribution throughout the medical record of the millions of data items in the medical vocabulary based on data entry also prevents the development of intelligent medical systems by leading to an exponential database design. Furthermore, the exponential rise in complexity in such a design limits the system's size, performance, and quality of the code.

The clinical architecture developed by the VA is partitioned based on the hierarchy of systems biology (DNA, cellular components, cells, tissues, organs and organ systems). The partitioning allows scaleable deployment utilizing grid computing. Furthermore, the architecture is designed to join the two ends of medical sciences: bioinformatics (genetics) with medical informatics (health care delivery) by the use of a common architecture.

Competitive Advantage

Currently, the architecture of clinical repositories is in the form of a NP-Hard (non-deterministic polynomial-time hard) design. In contrast, the hierarchical infrastructure developed by the VA is polynomial allowing more knowledge to be encoded in individual partitions within the repository.

This invention:

- Allows medical therapy to be customized to a patient's genetics (personalized healthcare).
- Can automatically handle disease-to-disease interactions leading to appropriate treatment of patients.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).