



Hippocratic Database Privacy Enforcement and Compliance Auditing

- Value Proposition

Financial Markets

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Gramm-Leach-Bliley and its challenges

FINANCIAL MARKETS

GRAMM-LEACH-BLILEY, 1999

TITLE V – PRIVACY

Clear disclosure of privacy policy regarding sharing of non-public personal Information with affiliates and third-parties

Option to 'opt-out' of sharing of non-public personal information with non-affiliated third parties

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Challenges in implementing Gramm-Leach-Bliley (GLB)

- Communicating and implementing compliance policies between departments
- Automating and streamlining existing compliance processes
- Satisfying increasing client demand for information
- Ease of implementation
- Meeting the growing number of regulatory requirements

Satisfied by the Hippocratic database solution



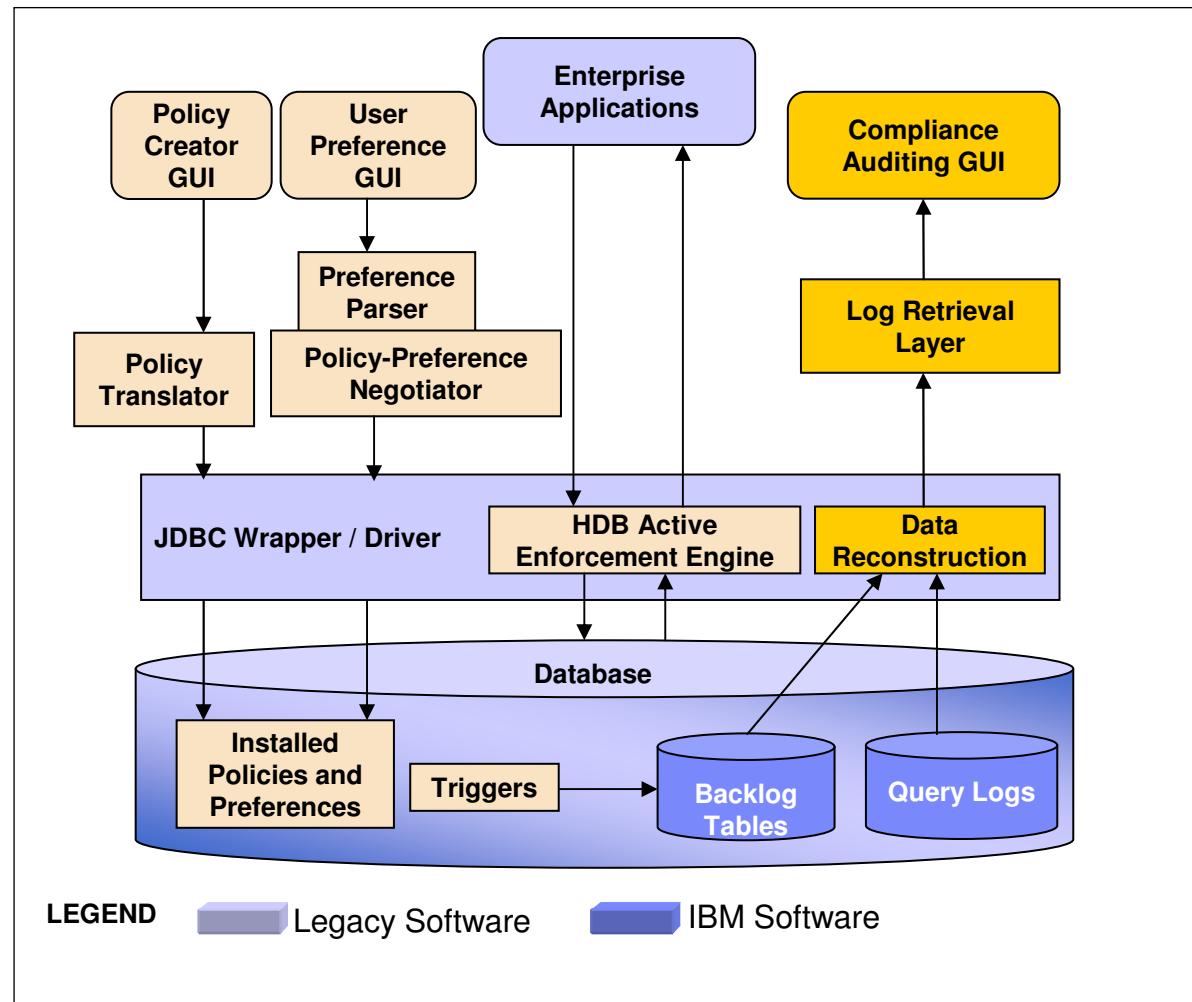
The Hippocratic Database solution

This solution consists of –

a) Active Enforcement Component

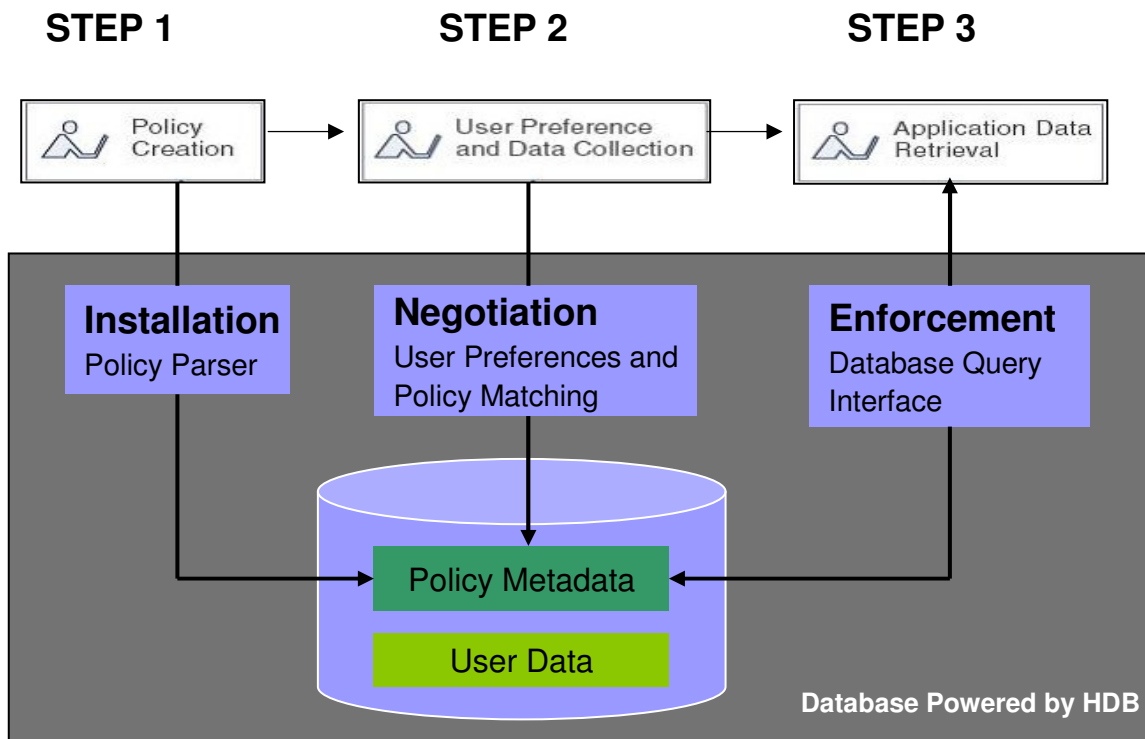


b) Compliance Auditing Component



1. Active Enforcement component

Enables the Hippocratic database to reveal only data compliant with policy



Active Enforcement value proposition

➤ **EASE OF INTEGRATION**

- Existing applications do not require modifications

➤ **DATABASE AGNOSTIC**

- Does not require changes to the Database

➤ **EASY ENFORCEMENT AFTER POLICY MODIFICATION**

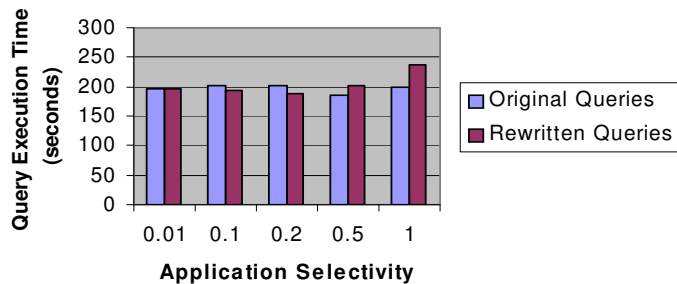
- Centralized creation and updating of policies
 - User need not be educated of new or changed policies

➤ **FINE-GRAINED**

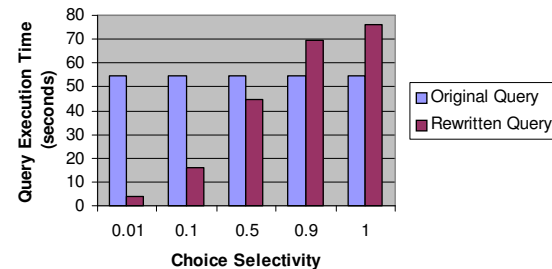
- Policy and user disclosure control at database cell-level as against row/column level

➤ **PERFORMANCE**

- Gives a significant improvement in system performance only in cases where the user has specified disclosure preferences



WORST CASE: Everyone discloses everything. Query processing yields no value. The penalty is 5-15% of the execution time of the original query.



STANDARD CASE: Choice Selectivity varies. In best case, HDB Active Enforcement gives an order of magnitude improvement.

2. Compliance Auditing component

Enables verification of compliance with policy

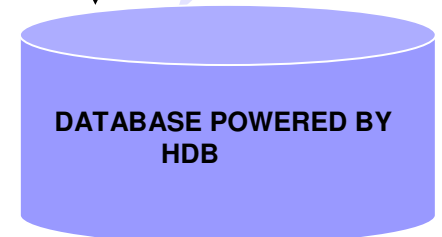
The component -

- *Determines who accessed* designated data, *for what purpose, when it was accessed* and *what changes were made.*
- *Is agnostic to enterprise applications and database systems*
- *Has minimal impact* on the company's operations.
- *Tracks disclosures down to the cell level* in the database.
- *Has a security advantage* over logging systems.
- *Reduces audit time.*



Who read J.Cherian's information in 1987?

Here is a list: S.Sampath got his financial details.. S.Purohit asked for his credit history



Compliance Auditing value proposition

➤ **Cost Reduction**

Reduces the cost of manual auditing processes

➤ **Low Impact**

Can be integrated into the existing architecture without affecting current operations

➤ **Extensible**

Enables development of customer insight applications

➤ **Security**

Resistant to predicate-based attacks

This is FIRST-OF-A-KIND!

The Hippocratic Database (HDB) solution

- ***Does not require alteration*** of enterprise applications, relational database systems
- Provides disclosure auditing and ***policy enforcement at Database Level***
- ***Enforcement at Cell-level*** rather than row/column level offered by other solutions
- ***Improves request processing speed***
- Facilitates a ***check for conflicts*** between user disclosure preferences and company's policies at the system level
- Uses ***Logical Logging*** that records the exact response given to a user
- Simultaneous enforcement and auditing ***without significant performance impact***



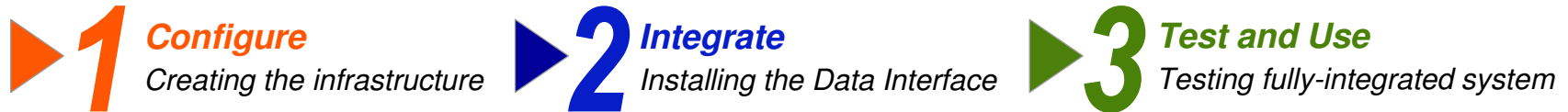
HDB IS THE FIRST SOLUTION IN THE MARKET TO OFFER ANY OF THE ABOVE MENTIONED FEATURES

Solution value proposition

COMPONENT	DISTINGUISHING FEATURES
Overall	<ul style="list-style-type: none"> ▪ Enables companies to be <i>accountable for unauthorized disclosures</i>. ▪ <i>Can be used in any environment</i> with relational/non-relational* databases
ACTIVE ENFORCEMENT COMPONENT	<ul style="list-style-type: none"> ▪ <i>Database agnostic</i> ▪ <i>Promotes scalability and performance</i> ▪ <i>Easier enforcement of policies</i>
COMPLIANCE AUDITING COMPONENT	<ul style="list-style-type: none"> ▪ <i>Performance advantage</i> over other auditing applications ▪ <i>Security advantage</i> over other auditing solutions ▪ <i>Cost-effective</i>

* **Note:** Can be reused in environments with a non-relational database with the help of a compiler to enable the system to interact with the HDB layer

Implementation Methodology



Phase 0: Preparation and evaluation	Phase 1:	Phase 2:	Phase 3:
	<u>Inputs</u>	<u>Inputs</u>	<u>Inputs</u>
	<ul style="list-style-type: none"> • Disclosure policy requirements, including users/roles, purposes, recipients and the connections to application contexts 	<ul style="list-style-type: none"> ▪ The data interface points for the target system Micro design 	<ul style="list-style-type: none"> ▪ HDB-enabled system
	<u>Activities</u>	<u>Activities</u>	<u>Activities</u>
<ul style="list-style-type: none"> • Define the policy rules • Use the HDB Control Center to install HDB metadata policy files for the data source(s) • Use the HDB Control Center to create the auditing infrastructure 	<ul style="list-style-type: none"> ▪ Augment the chosen interface points to perform query rewriting and query logging. 	<ul style="list-style-type: none"> ▪ Perform integration testing ▪ Perform use case testing 	
<u>Output</u>	<u>Output</u>	<u>Output</u>	
Data system contains the necessary structures to perform fine-grained enforcement and auditing	HDB-enabled data system	Executing, policy-compliant system in active state	

ACADEMIC MEDICAL CENTER (AMC), AMSTERDAM

Medical centers in the Netherlands have a *wealth of information that can be leveraged to drive breakthroughs* and deliver innovation in healthcare. However, *data sensitivity*, the fragmentation of records *and complexity* in retrieving the same *have inhibited advances* in this area. In order to open up this data to researchers,

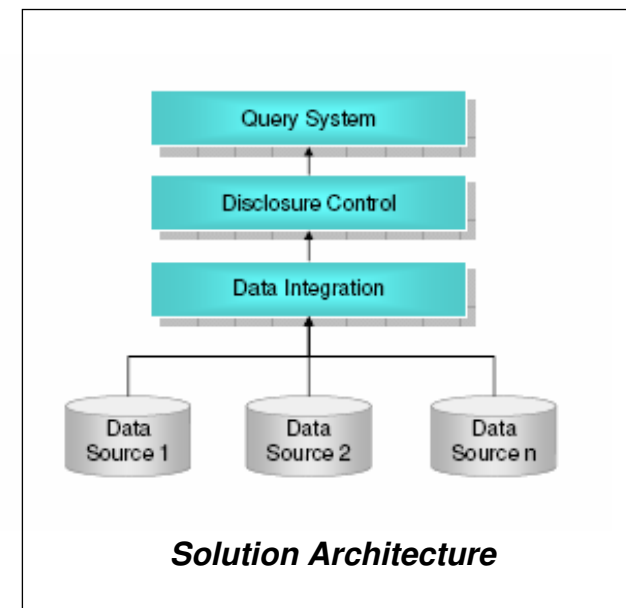
AMC has setup a framework that addresses problems outlined, mitigates risks for practitioners and patients and enables medical innovation to proceed.

ISSUES ADDRESSED BY THE SOLUTION

1. *Data Integration* through WebSphere Information Integrator (WSII)
2. *Disclosure Control* through **Hippocratic database technology**
3. *User Interface to facilitate querying* provided by Data Discovery and Query Builder

SYSTEM BENEFITS

- *Efficient data management*
- *Privacy and security issues enforced* by the system.



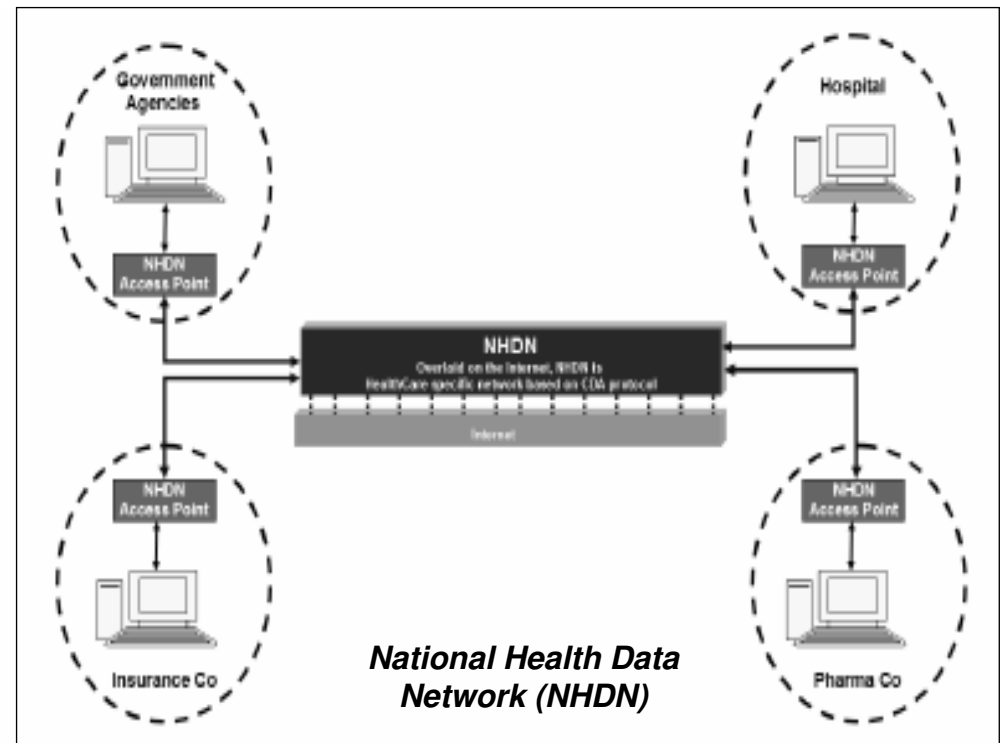
NATIONAL HEALTH DATA NETWORK (NHDN), INDIA

In India, most of the *healthcare records are on paper* and transactions are managed manually. This *invites error, inefficiency and prevents timely analysis of data* to detect health related emergencies. Hence, it became *crucial to establish a standards-based, safe and secure IT backbone* that naturally *collaborates health institutions* nation-wide and enable service providers to form a network *so operational, clinical and financial synergies can be realized*.

DESIGN CONSIDERATIONS FOR NHDN

1. *Safe and secure* using **Hippocratic Database technology**
2. *Standards-based* using Structured Query Language
3. *Facilitate data integration* and federation from disparate systems using WebSphere Information Integrator
4. *Scalable and fault-tolerant* for nation-wide deployment using Grid Technology

This solution is also to be deployed in Taiwan and Israel



Additional References

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Documents

- **Managing Disclosure of Private Healthcare Data with HDB**
A white paper detailing the HDB solution
Link:
http://www.almaden.ibm.com/software/projects/iis/hdb/Publications/papers/nc_hdb_white_paper_health.pdf
- **Enabling Biomedical Research in Europe: Using the Dutch Experience as a Template**
▪ This document details the HDB solution deployed for Academic Medical Center, Amsterdam
Mail Request to: tyroneg@us.ibm.com
- **A National Healthcare Data Network for India**
This document details the HDB solution deployed for the National Healthcare Data Network, India
Mail Request to: tyroneg@us.ibm.com
- **HDB User Guides**
These documents outline how to install and use HDB Active Enforcement and HDB Compliance Auditing solutions.
Link:
http://www.almaden.ibm.com/cs/projects/iis/hdb/user_docs.shtml