



Collaborative Research on Web Dissemination of Geotechnical Data

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Agency, Academia and Industry Collaboration

- **Phase I: Needs Workshop, October 4-5, 2001**
“Archiving and Web Dissemination of Geotechnical Data”
- **Phase II: Pilot Implementation Plan and Workshop, January 2003**
“Archiving and Web Dissemination of Geotechnical Data II”
- **Phase III: Long Term Plan for Virtual Geotechnical Data Center**

Phase I: Needs Workshop, Oct. 4-5, 2001

“Archiving and Web Dissemination of Geotechnical Data”

Project/Workshop Objectives:

- **Identify User Interest Nationally – Agency, Academic, and industrial**
 - **Exchange Current Expertise**
 - **Develop Consensus Vision & Action Plan to design and implement a Virtual Geotechnical Data Center**
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Need for a Virtual Geotechnical Data Center

- Borehole and seismic data can be used in the earthquake hazard problem
 - Direct estimation of site effects
 - Nonlinear effects of ground motion
 - Ground motion prediction – scenario earthquakes
 - Details of earthquake source
 - Liquefaction and landslide zonation
 - For Caltrans and other agencies, access to geotechnical data provides a cost effective means for data distribution, real-time access, thus savings in time and resources
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Caltrans' Motivation

- Currently a paper-based organization
- Need for more efficient information system



October 4-5, 2001 Workshop

@ PEER, Berkeley: <http://peer.berkeley.edu/>

- 35 Attendees: Users, Providers, Developers, IT
- Plenary Themes
 - Life Cycle Development Case Studies
 - Data Dictionary and Data Formatting Standards
 - Information Architecture
 - Data Quality Assessment Criteria
- Breakout Themes
 - Archiving and web Dissemination Formats
 - Implementation Action Plan
 - Long-Term Funding & Support

Development Case Histories

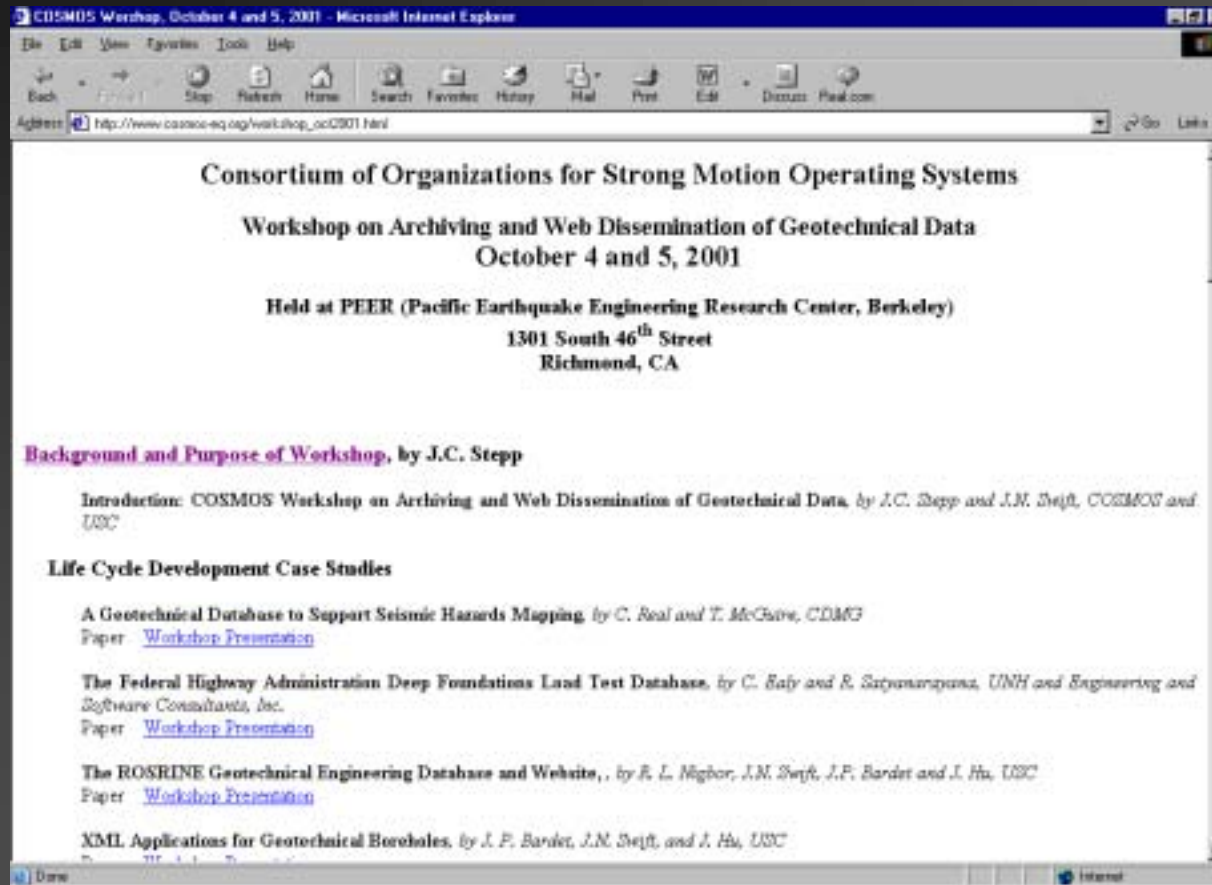
■ Web-Based Archive & Data Dissemination

- CGS (CDMG): Geotechnical Database for SHMP
- NGES: Federal Highway Administration Deep Foundations Load Test Database; Standards for Lab Tests
- UCB/BYU: Kocaeli Liquefaction Site Data
- USC: Lateral Spread Case History Database
- KU (Japan): Kobe Subsurface Info for Seismic Hazard
- UCSB: Downhole Data and COSMOS Database
- ROSRINE: EQ Site Data for Site Response
- USGS CPT Data

■ Automated Data Processing

- USGS Geologic Site Database and Data Acquisition for Stratigraphic Model Development
- Fugro on San-Francisco-Oakland East Span Seismic Safety

Phase I Workshop Website & Proceedings

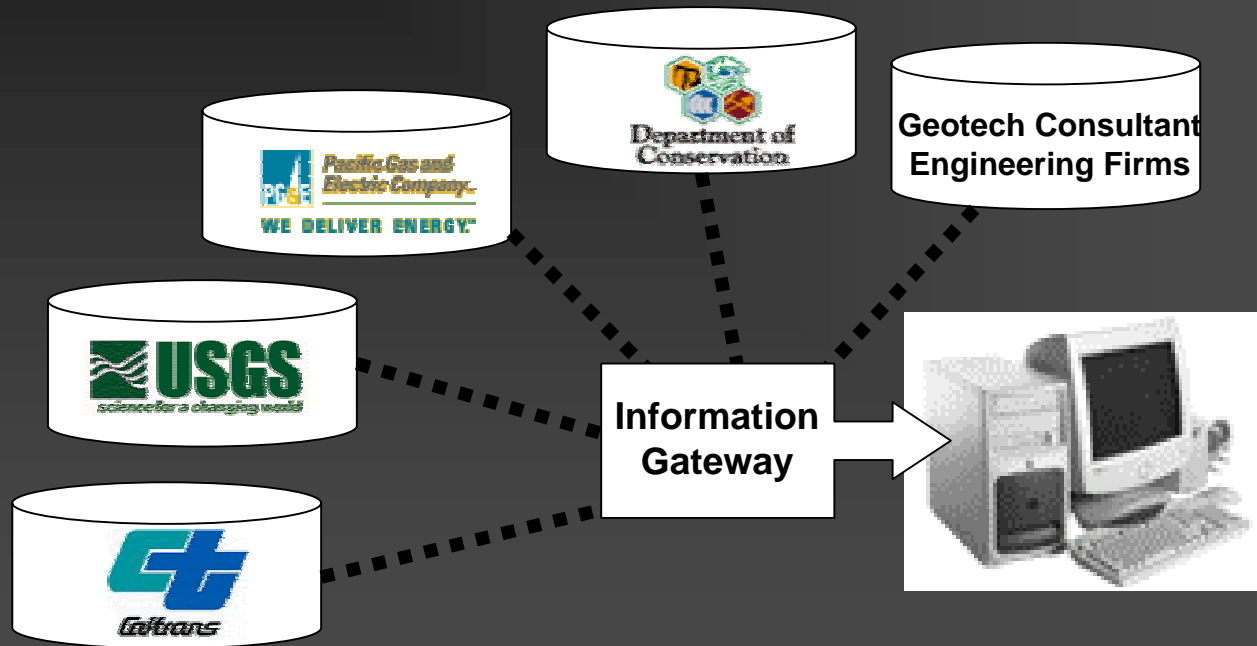


http://www.cosmos-eq.org/workshop_oct2001.html




Phase I Workshop Findings

- **Need & benefit is very high & timely**
- **Common vision is achievable**
- **Existing technologies are sufficient**
- **Institutional barriers can be managed w/
proper architecture**

General concept of web-based virtual data dissemination center



Funding Scenario Phases

1. **CDMG, Caltrans, USGS & PG&E - development of virtual system and conversion of their data into common format – funded for May 2002 – March 2003**  **CA Pilot**
2. Planning phase could be funded by broad coalition of State and Federal Agencies – Phase III  **Consensus**
3. Long term could be supported though a combination of Agencies and user license fees – Phase III  **Maintenance & Upgrading**

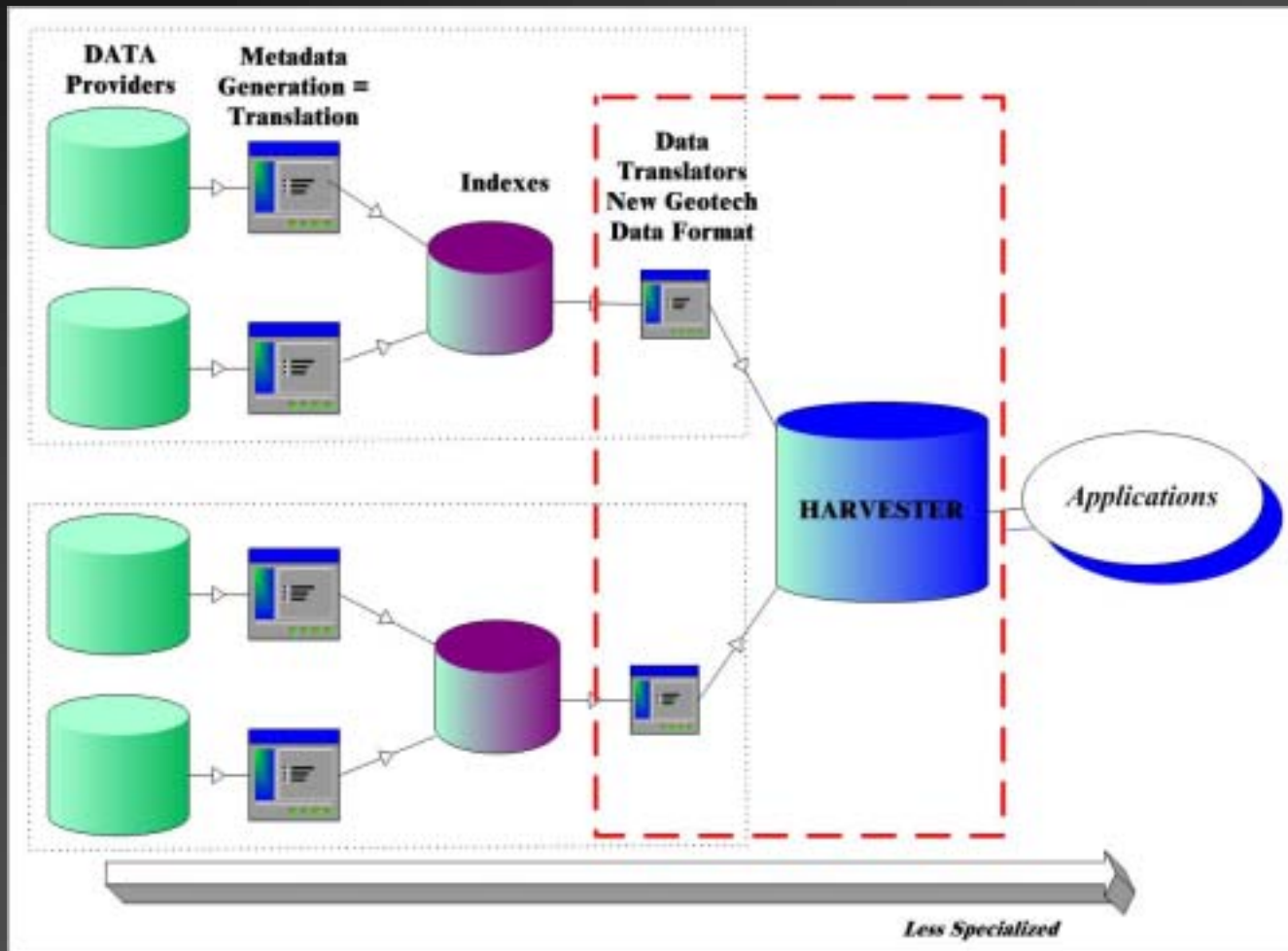
Phase II

Scope of Short-Term Project

- Define geotechnical data user scenarios for a pilot virtual geotechnical data center system
 - linking CDMG, Caltrans and USGS geotechnical databases, PG&E participating in User Scenario study
- Develop a data dictionary standard for the pilot system
 - expansible to a larger system that could link multiple databases
- Integrate these results to implement the pilot system
- Plan and implement a workshop structured to obtain geotechnical community consensus
 - deliver a workshop proceedings that will serve as an expanded implementation plan for development of a web-based system for archived and linked dissemination of geotechnical data

Short Term Objective

Possible Pilot Harvesting Architecture for 4 data Providers:



Summary of Objectives

- **Phase II Short Term Activities**
 - **Establish 3 Working Groups**
 - User Scenarios Work Group (USWG)
 - Data Dictionary Work Group (DDWG)
 - Virtual Data Center Work Group (VDCWG)
 - **Design “Pilot VDC”**
 - Initially linking CT, CDMG, USGS, PG&E
 - To be developed at USC
 - **Workshop in Jan '03 for Plan Review**
- **Phase III Long Term Plan**
 - **Install Pilot VDC**
 - **Extend to other organizations, dB's, regions**

Phase II Working Group Participants

- Caltrans
- CEC
- CGS (CDMG)
- City of LA BOE
- COSMOS
- Earthsoft, Inc.
- Engineering and
Software
Consultants, Inc.
- FHA
- GCA (gINT)
- Geovision,
Inc.
- LADWP
- NEESgrid
- PEER
- PG&E
- POSC
- UCSB
- UI NCSA
- UNH
- USC
- USGS
- UW, Seattle

Caltrans - Related Projects & Objectives

- Applications aimed at automated processing and graphical delivery of geotechnical data over the Internet
 - Innovative web technologies
 - Web-based GIS tools
 - Integration with GPS

Caltrans - Related Projects

- CPT (Cone Penetration Test) Data
 - Consists of detailed information about test locations and contain hundreds or thousands of numerical entries such as depth, resistance, angles, etc.
 - Allows users easy access to existing CPT data at previously tested locations
- Real-time Landslide Deformation Monitoring (under development)
 - Will provide positioning data from high precision GPS sensors installed on active landslides
 - Will utilize web-enabled GIS for graphical presentation of spatial deformation data

CGS – Related Projects & Objectives

- SHMP WebMap Project – Designing and Implementing a GIS Mapping Website for Data Dissemination and Interactive Mapping
 - *Geotechnical Data - Borelog database reporting and dissemination (XML)*
- SHMA, '90 – Identify seismic hazard zones and assist cities and counties in protecting public health and safety from the effects of:
 - Liquefaction
 - Earthquake-induced landslides
 - Strong ground shaking

CGS – Purpose of WebMap Project

✦ External Users

- Facilitate public access to Seismic Hazards Mapping data
- Demand for GIS data to integrate with desktop GIS

✦ Internal Users

- Provide a cost effective means for data distribution
- Real time release of zone maps

USGS – Projects & Objectives

■ Geologic Site Database and Data Acquisition for Stratigraphic Model Development

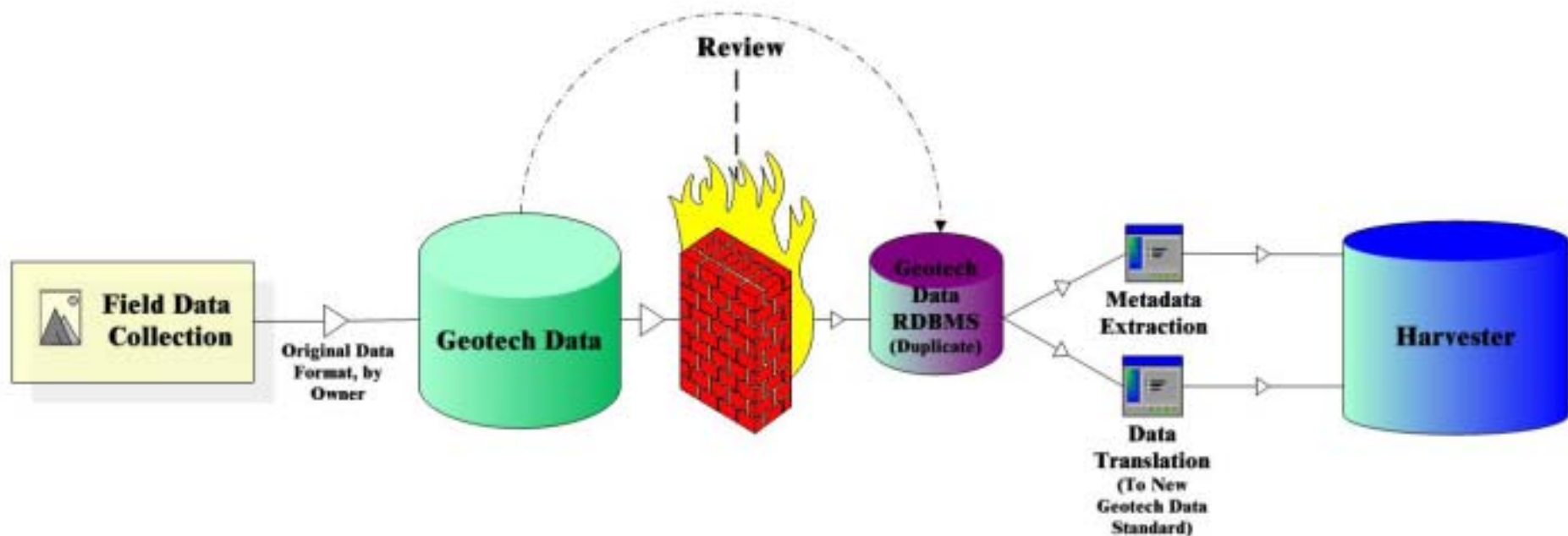
- Purpose: Input into development of detailed 3-D stratigraphic and structural models of Quaternary basins in California
- *Currently LA and Santa Clara Valley*



USGS Primary Data Inputs

- Geotechnical Boring Logs
- CPT Logs
- Oil and Water Well Lithology Logs
- Oil and Water Well Electric Logs
- Outcrop and Core Descriptions
 - *e.g. sedimentological information*
- In-situ Measurements (e.g. s-wave, SPT)
- Seismic reflection profiles
- Gravity/mag/EM profiles
- Sample Analyses

Schematic of Caltrans, CGS or USGS participation in Phase II



Conclusion - Phase III Geotechnical VDC

