

# An Approach for Developing a Geological Information Searchable Database

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**Abstract:** Every Country, especially Country like India has a huge collection of Geological databases and also contains many Historical Exploration Reports (Mineral, Groundwater etc.) or any Geological Reports (like .pdfs, .doc, .xls etc.), but only few Historical Reports are Scanned and are properly maintained in a database, which will be available to Public or for Mining Companies for making any decisions, but still need to collect a lot of reports or information (Historical data of Geological, Geophysical, Geochemical, Groundwater etc.) which are done by many government & non-government organizations. The aim of this paper is to explain how important it is to capture all the existing historical data and need to maintain a proper database for future references that helps for decision making.

**Keywords:** Geological Information, Historical Reports, Data and Information

## 1. Introduction

The systematic collection and evaluation of historical data to describe, explain, and understand actions or events that occurred sometime in the past and there is no manipulation or control of variables as in experimental research. Lots of valuable historical and current exploration data is available in various formats in the public domain. These data when transformed into a structured input to a decision making system can deliver business value. In this paper an attempt is made to provide the importance of historical reports and the need for developing a Geological Information Searchable database (GISD).

## 2. Literature Review

### Purpose of Historical Report Search

To make people aware of what has happened in the past in order to learn from past failures and successes, apply them to present-day problems, make predictions, and understand present educational practices and policies more fully. In Exploration and Mining, historical data is as important as presently generated data, it is a well-known fact that any exploration company wants to get access to all the relevant historical data before they put men and machine on the ground. This frequently involves a re-examination and re-interpretation of old data in the light of new theories or new knowledge, by knowing the target area well can save millions of dollars in exploration as the operations are prohibitively cost intensive.[1], [2]

Historical data used in this paper refers to geological, geophysical, geochemical, mineralogical and relevant to geoscience information. It may exist in the form of documents, excels, pdfs, images, scanned reports, maps and other geoscience relevant data. Most countries have a government geological survey and a comprehensive database housing products and information of geoscience data to provide for government and non-government organizations for implementing any policy decisions on natural resources,

public health and safety, environmental protection and infrastructure planning.

During the reconnaissance stage many of the mining companies will review the records or available historical data of previous exploration, by identifying the target from these historical reports can maximize the benefit of providing the high quality geoscience information and it can be useful in a cost effective manner.

## 3. Methodology

### 3.1 Steps Involved

Defining the Problem, Identifying the relevant sources like Documents, Reports, Numerical records and relics etc., Summarizing information obtained from historical sources and finally evaluating the historical sources. Historical Data collection is the process of gathering and evaluating information on variables of interest by collecting the different reports from District, State and Country from both government & non-government organizations. Figure 1 shows the collection of data (reports) and summarizing information.

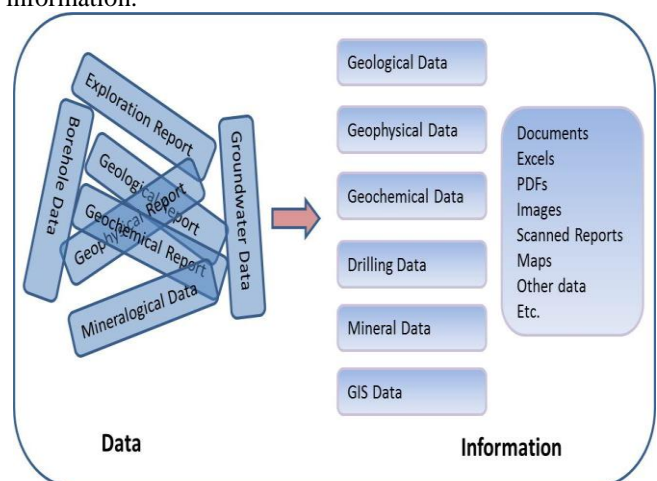


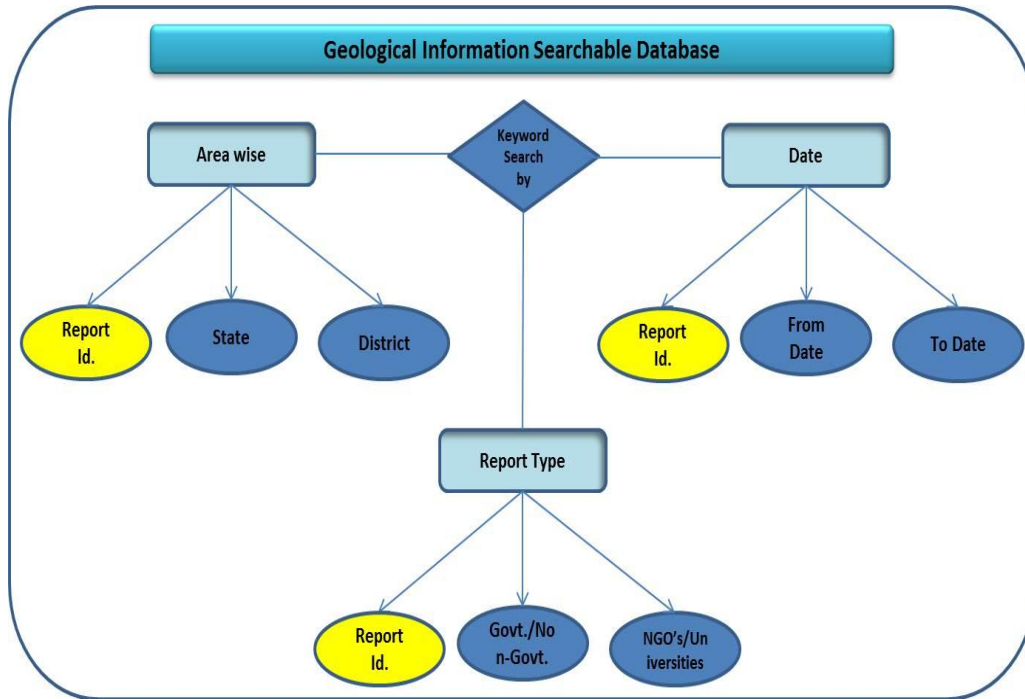
Figure 1: Data and Information

### 3.2 Database Design

Database Model diagram is a visual representation of the database design and database model which helps to describe processes, interfaces, data stores and data flows, and this diagram can save hundreds hours of work.

The Entity-Relationship (ER) model is a conceptual data model that views the real world as entities and relationships.

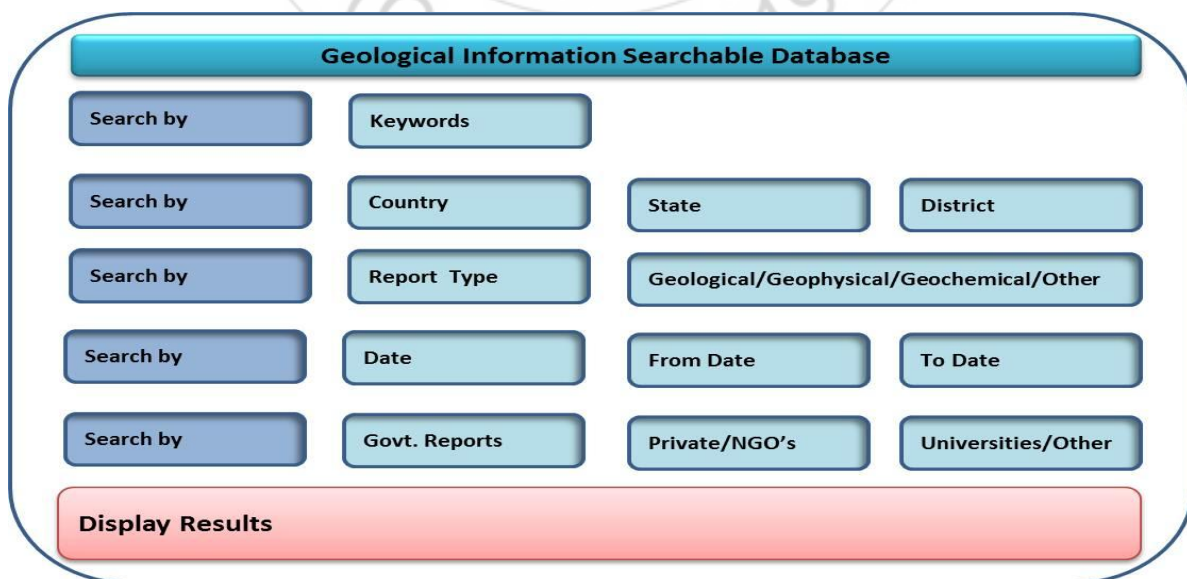
A basic component of the model is the Entity-Relationship diagram which is used to visually represent data objects; it is simple and easy to understand the model and can be used as a design plan by the database developer to implement a data model in any database management software. Figure 2 shows the Sample Entity-Relationship Diagram for the Geological Information Searchable Database.



**Figure 2:** Sample ER Diagram

Once the database is designed, storing the data is possible and Report catalog containing categories and subcategories of different report information, then build an attractive and functional user interface (UI) that allows for easy Report catalog browsing. A Report data search is performed by

selecting and setting criteria like Selecting by Keywords, Country, State, District, Report type, Date etc., Scanned documents are available to browse, print, or download. Figure 3 shows the Sample web portal for the Geological Information Searchable Database. [3]- [5]



**Figure 3:** Sample Geological Information Searchable Database (GISD)

The Geological Information Searchable Database offers a unique identity and divided into the Content Presentation - content may present in more than one web page, containing Powerful Search Facility, Visual Themes like color scheme, images, logos etc., User Management like Role based privileges for viewing, editing, designing, system administrator etc., Authentication like general public need not login to browse the information in the site, Content Management like Editing, Publishing, Indexing, Help menu, Download and upload the reports etc.

In the Geological Information Searchable Database finding the Reports with multiple search options is possible like Search by Keywords, Search by District, State and Country, Search by Report type like Geological/Geophysical/Geochemical/ Other, Search by date, and Search by government and non-government reports.

#### 4. Results/Discussions

The main objective of this Geological Information Searchable Database (GISD) is to compile the information (Historical reports) and maintaining a proper database can provide high quality geoscience information which can be useful in a cost effective manner.

Comparisons of both new and old reports and data can be used as case studies and for further investigation and can save time and efforts, the development of new prospecting techniques creates a need for comparing the usefulness in new discoveries. Comprehensive Report information on a single platform can accelerate business decision making process and can save time and efforts. Geological Information Searchable Database will help to analyse and reduce risk factors for Strategic planning and also for new projects. One can easily access the data which can lead to more and better mineral exploration, which results in new discoveries, development and production, and can increase the economic prosperity. It can increase transparency and also fair competition between companies.

#### 5. Conclusion

By developing and implementing the Geological Information Searchable database portal, can maximize the benefit of providing the high quality geoscience information that is relevant to the needs of the country and it can be useful in a cost effective manner.

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