G.O Geoscience Online: Tracking knowledge and increasing project efficiency

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Abstract

This paper presents the G.O (Geoscience Online) platform and proposes a workflow that can be applied in private companies and universities. This platform enables not only the tracking, the integration with external sources, and the storage of scientific articles; but also offers a dynamic environment where its usage, its data loading and the creation of new content are part of the daily activities of any Geoscientist in the academic or business world.

The platform uses a cloud-based solution, where all the data is correlated and easily accessed using its own tools. This data can also be shared via connectors or uploaded to other applications.

Introduction

When comparing the general Brazilian university environment to companies, it is easy to understand why dealing with information is such a hard task. The project team changes every year, the infrastructure may not be adequate to the project, the budget can be challenging and commonly the results are not conclusive.

Currently an innumerous amount of virtual libraries are available facilitating the research, but compiling all references from a project completed a couple of years ago might be a difficult task.

Apart from those facts, Geoscience information is not easily stored, files are large and special software may be required to explore the data. The information condensed into a thesis or any publication is a filtered subset of the most relevant part of a research. Should another study group require continuing the theme, a lot of information would have to be replicated or requested through bureaucratic procedures.

The G.O solution proposes a workflow where all of the data used in Geoscience projects are combined into an interactive platform that is used daily either during ordinary classes or for research purposes, and can accessed by any computer or portable device.

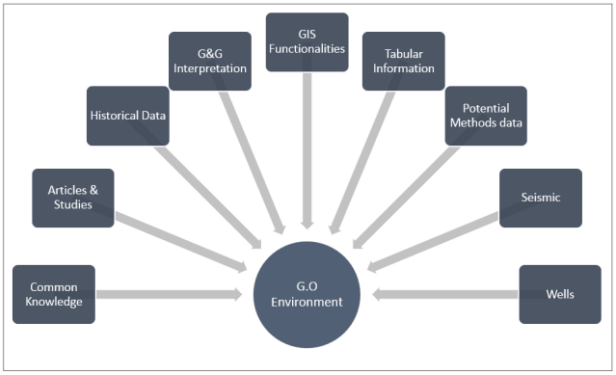

Figure 01: Diagram of data integration and information available in the cloud platform.

Platform Description

Geoscience Online is a platform currently in development in Brazil. Its requirements were determined based in a combination of common elements of a G&G research software and standard indexation softwares. G.O compiles the following features:

- Informative main web page used to keep the community up to date with the latest events and publications.
- Cloud data repository to store and retrieve any information used in the research projects
- Technical data tools to display and provide simple interpretation and basic processing tasks. The tools are applied to seismic files, multi-beam data, well data files, grids and horizon manipulation, as well as other file types commonly used in the industry.
- GIS interface that connects all the information and allows people to navigate in a fluid and interactive way across the different environments.
- Collaborative environment where users can invite colleagues to participate in common projects within a research network, connecting specialists from different institutions to work together in real time.
- Administration environments used to register users, define data entitlements, set up and organize projects, among other uses.

Figure 02: Start Page, example of the pilot system implemented at the Universidade Federal Fluminense (UFF).

Data Gathering Workflow

The data gathering workflow starts with an intense effort to structure the existent raw data and input them into the system. Information such as cultural data, regional maps, seismic surveys, well data, potential methods, cores and samples, outcrops database as well as the entire content of the institutional virtual library are considered raw data and are easily loaded into system.

The complete setup and online availability of this data allows researchers to perform project assessments in an efficient way and helps build a strong attachment to the platform right at the beginning of the project.

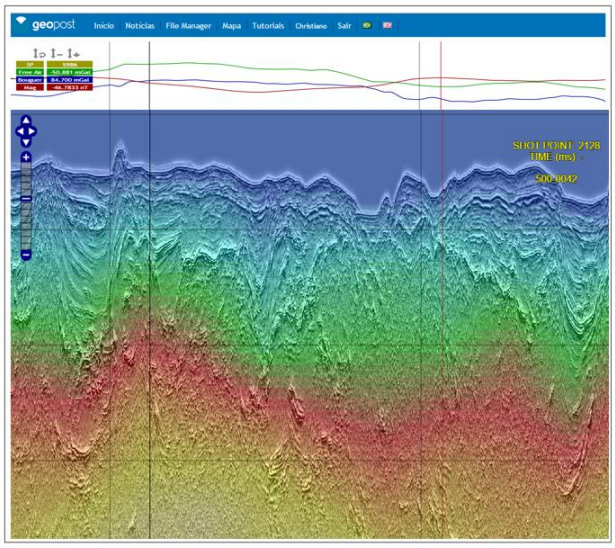

Figure 03: Example of an assessment done in G.O, using seismic, velocities, magnetic and gravity data.

After the initial data input, an organic and steady evolution of the information available can be seen, based in the certification process established where every project must be validated prior to its approval for publications.

Considering this scenario, the data loading tasks are assigned to the groups that have a deep knowledge about the particular data sets, facilitating the automatized creation of indexes, as well as avoiding common mistakes.

Later on, a vast amount of information, data and knowledge are produced inside the G.O portal using its own interpretation tools.

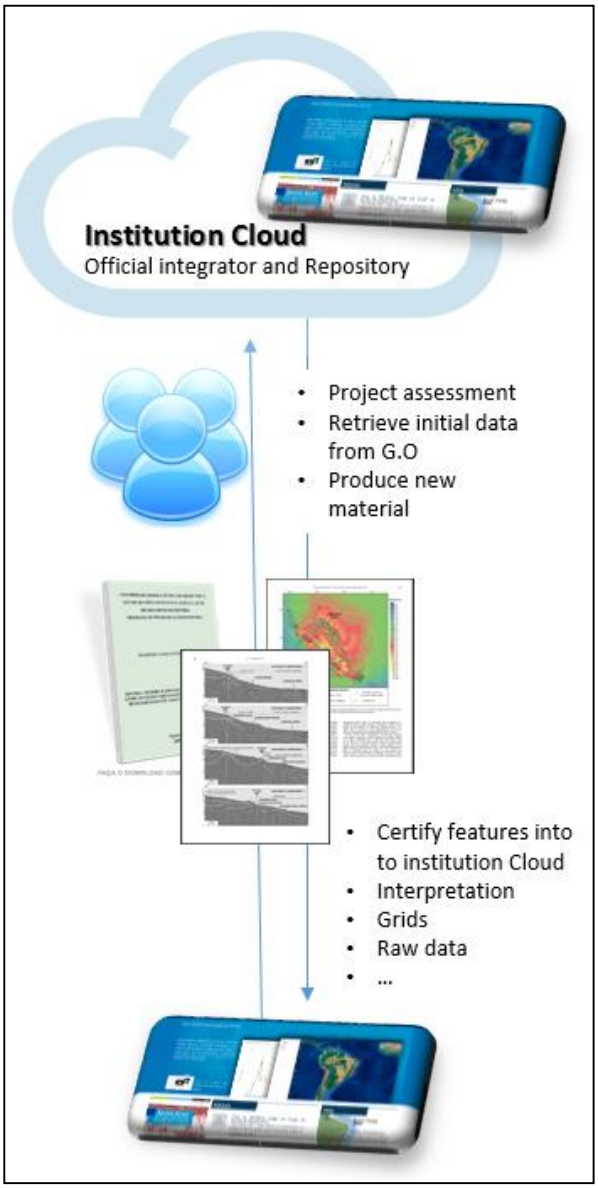

Figure 04: Workflow of a project. Starts by retrieving information from the system and finishes by uploading results for future studies.

Application and Advantages

The platform was developed to increase productivity inside Brazilian universities and enhance not only the flow of raw information but also the creation of knowledge and intelligence through time.

Some of the main applications and advantages for the proposed methodology are:

- Manage University Libraries
  As the libraries of the universities are very dynamic and increase rapidly according to the number of products, it becomes mandatory to have a tool to index and correlate every item in the database based in keywords, area of knowledge or spatial features.

- R&D projects communication
  Companies are investing in national intuitions and G.O is a perfect solution to keep this information synchronized, organized and readily available for all parts to work on.

- Classes and workshops
  Some laboratories can be well equipped but these are rare exceptions, G&G software licenses have availability problems for simultaneous use. Using G.O, simple interpretation studies and workshops can be easily performed in personal computers or portable devices.

- High Availability
  All the data library can be accessed from anywhere in the world with a reasonable internet connection.

- Collaborative work
  Get experts to work together by sharing sections and projects with anyone. Create dynamic technical forums in a virtual environment.

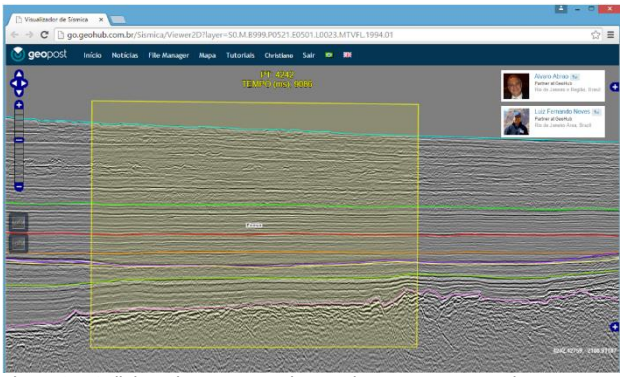

Figure 05: Collaborative Interpretation Environment connected to workgroups and social networks.

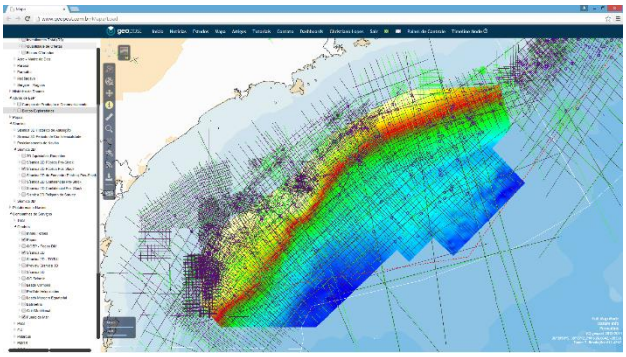
Figure 06: Example of the GIS environment used to retrieve and evaluate data.

Results

The G.O platform has been available for less than a year and we are still mapping the results of the project based in our latest implementation. Up until this moment, our group noticed the following remarks:

- Speed data retrieval and project assessment.

- High participation of undergrads students in projects involving oil and gas datasets.

- Good promotion of connectivity between different institutions, integrating their data in a single cloud environment.

- Dissemination of knowledge in an appropriate environment compatible with Geoscience ideals.

Conclusions

Collaboration and knowledge sharing among researchers from different workgroups are some of the most important and challenging tasks these days. Part of these challenges is caused by a lack of standard workflows and data repositories that accommodate the needs of G&G researchers, as well as the single purpose and lack of appeal presented by the existing traditional repositories.

The G.O platform provides a set of mechanisms that creates a multidimensional environment promoting knowledge by providing access to information with no hardware or software requirement, encouraging the collaboration between different users with a common objective.

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