

# Data integration in a war zone

*Finding, managing and integrating data can be a challenge in any environment. A team recently undertook this task in war-torn Iraq.*

### AUTHOR

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The oil and gas industry routinely faces significant challenges and extreme conditions in the discovery of hydrocarbons because of geography, climate conditions or war. In dealing with these challenges, we normally think of employing seismic crews, engineers or drillers.

Although Geotrace's Tigress software division was not exploring for oil and gas, it overcame all three of these obstacles recently in building databases of several large fields in Iraq by bringing in information analysts, interpreters and data managers.

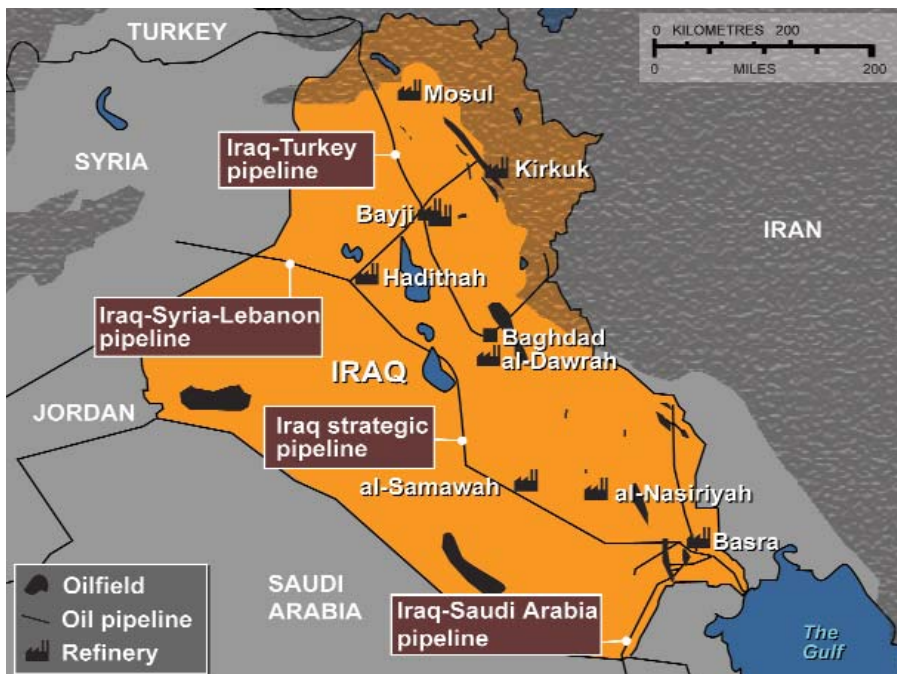
Tigress, which stands for The Integrated Geoscience and Reservoir Engineering Software System, provides exploration and production (E&P) companies with a wide range of software and services to assist them in effectively and efficiently managing large amounts of data.

The software takes an integrated real-time approach to data management. It assumes that a company's database is a living organism and that it completely describes the company's operation. In the early stages of an exploration company, data is often all it has to describe assets and confirm a company's value.

### The objective

The team was tasked with locating, preparing and quality-checking large volumes of disparate data for several large oil fields in Iraq determined to be worth billions of dollars.

Several challenges presented themselves in completing this project, including the uncertainty of working in the Iraqi environment and having to work under a



Map of the major oil fields in Iraq. (All images courtesy of Geotrace)

tight timeframe of only 3 months to first interpretation.

The work conducted by the team was extremely valuable to the customer, who did not yet know the full value of the assets because so much of the data was disorganized and not able to be evaluated because of infrastructure damage and turmoil as a result of the ongoing war.

### The uncertainties of Iraq

Following military intervention in Iraq, the new government found itself custodian to some of the largest oil reserves on the planet — the country's principal source of revenue for building and reconstruction. Insurgency was a major issue, and a petroleum law did not even exist. Even though the political situation remains tenuous, there was much disagreement on how to move forward. However, it was necessary to provide an independent assessment of the E&P resources available.

The team was surprised to learn how closely the data management situation in post-war Iraq mirrored the situation in many oil companies in stable political environments. Some data was lost and took time to locate or recreate. There was no central catalogue of the data available or its location. Some data were damaged and had to be repaired. Systems and procedures needed to be established. The data volumes were large, and new data was being located and added to the database every day.

### Parameters of the project

At the outset of the project, it was decided that no allowances would be made for the highly political circumstances. That is, the database created would need to meet the same rigorous standards in terms of record-keeping and quality assurance applied at a "blue chip" oil company in a stable environment.

Additionally, it was determined that no

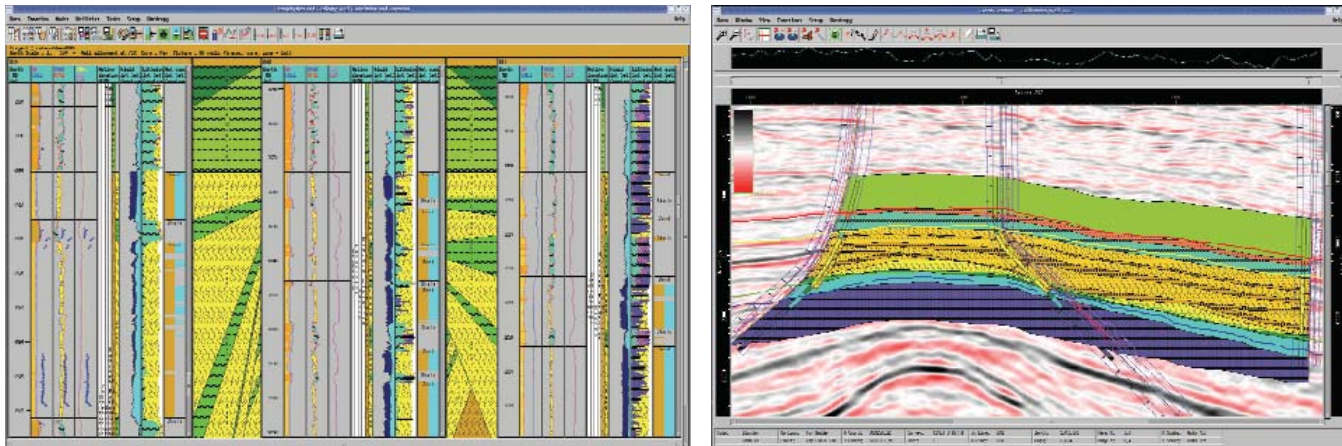


Figure 2. Integrated displays of geological and geophysical information.

concessions would be made in terms of both data security and access control.

Establishing exact standards at the outset of the project proved to be of critical importance. When setting up an E&P database from scratch, it is possible to compromise quality for speed. When up against a tight deadline, it always is tempting to focus on those areas that are of most importance in the short term. Although this does help achieve short-term deadlines, it is an unwise approach as these deadlines are soon eclipsed by more demanding information management considerations.

## Execution of the project

This large amount of data needed to be located, catalogued and loaded for several fields simultaneously. Interpreters hungry for data wanted their workstations populated as soon as useful data became available.

The team controlled the project workflow while keeping records of receipt and delivery along the way. At the same time, the team built a catalogue of data and constantly updated it, indicating the data's availability and condition.

Several weeks into the project, the scene was a living working data factory with new records arriving all the time that needed to be catalogued, checked and sent for pre-processing (repair, digitization, etc.).

The consultants running the project had always known that a real-time system similar to Tigris would be essential in managing a large and complicated project. However, they did not anticipate how challenging it would be to build a

database in several locations around the country without a link to the Internet. The team was able to coordinate eight separate databases in real time.

Building E&P databases always is a collaborative effort. This is one of the reasons why using an integrated approach is critical. The Iraqi case study is an excellent example that demonstrates this. Conflict often disperses people geographically. In the case of the Iraq example, many of the experts were also members of the Iraqi Diaspora. The knowledge held by these individuals would be essential to accurate interpretations; however, some were not ready to return to their homeland. Others had left before the conflict and had established homes all over the world, particularly in Jordan, the United States and various European countries. To ensure success, it was important to involve these individuals at the early stages of the database build. Waiting until the interpretation stage would have diminished the quality of the project.

## Integrated system importance

This unique project tested the benefits of an integrated system. In its original design, the software was conceived as an integrated system to bring together scientists or different disciplines to collaborate as part of an integrated asset team. In the case of the Iraqi case study, it was the integrated nature of both the data and the team which proved to yield some unexpected benefits.

## Lessons learned

Data in an exploration and production

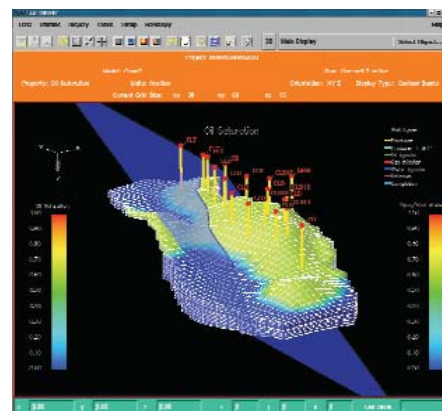


Figure 4. An integrated reservoir model.

database is in some form or fashion inter-related. What is often missed, however, is how these interrelationships can be used to repair, rebuild and sometimes create data from scratch — data that is essential to the success of an interpretation project. The extent to which the integrated database was used in Iraq to perform such tasks could not have been predicted at the beginning of the project.

The use of an integrated approach meant that any consumer of the information produced in the Tigris database could see at a glance what had been done, by whom and, most importantly, how and why.

The project in the Iraqi oil field might have been the team's most extreme data management challenge to date, but as often the case in such situations, it identified techniques, methods and possibilities that have extremely useful applications in somewhat more everyday operations.

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