*Gemcom Software was acquired by Dassault Systèmes, the 3DEXPERIENCE Company, in July 2012. It is now known as GEOVIA.

GEMCOM HUB™

Secure Remote Collaboration

Data Integration in Today's Mining Environment

WHITE PAPER

GEMCOM

Introduction

Modern mine operations generate and consume a huge amount and variety of data. For a mine, this might range from payroll and human/ equipment resource management to daily blasting plans, short- and long-term planning, survey and geology from the field, grade control, and life-of-mine planning. From this wealth of diverse data, different roles within the mine must create meaningful and actionable information with which to make effective decisions. All of this data is valuable to the operation and its loss or corruption can adversely affect the mine's financial position; therefore, it must be managed carefully to optimise productivity and profitability. This is especially true when the data is used by multiple groups where there is the potential for multiple versions or iterations of the data.

Sharing Data

Depending on the size and nature of a project, it is often necessary for a team or teams to collaborate and share data in various workflows. Operating mines tend to do this in an iterative fashion; in other words, data cycles through various phases, as daily blast reports are used to refine working models and inform short- and long-term planning. As data-related interactions and demands grow within the organisation, the need for accurate, timely access to the data becomes more pressing. To ensure accurate and efficient operations, it is important that all groups have access to the latest version of the data that impacts their role; otherwise, costly and time-consuming rework may result.

Simple file sharing is commonly used for data control and distribution. This approach—sometimes involving network-mounted drives or servers—is inexpensive and easy to implement, and it supports different workflows. But it has serious drawbacks: Locating shared data can be challenging, and attempts at structured naming and/or file location can result in huge numbers of folders and complex, esoteric naming conventions that end-users will need to remember.

Collaboration is difficult when data is not organized.

With simple file sharing, auditing capabilities are severely limited and earlier versions of data are typically overwritten and unavailable if needed for error correction or reference. Lack of effective version control can result in wasted time and work. In one industry example shared with Gemcom, an engineer worked on the wrong data version for days, resulting in problems which ultimately had to be addressed by senior executives. Other disadvantages include limited security options and the need for an effective and reliable connection to the network drive during the entire period of accessing the data.

Because a consistent and uniform data set is required to support effective decision-making, different groups should not be able to change the data independently. An effective method of data locking enables different team members to manage their shared data while they are disconnected from the central data management system. Data locking prevents people from making simultaneous revisions to the same file, a situation that can lead to changes being lost or misinterpreted.

Gemcom Hub™ addresses this issue by locking files while they are being worked on, preventing discrete sets of changes from occurring at the same time. With locking, it is possible to safely work on the next version of a resource model with the latest blast-hole data without affecting the day's schedule. Until the new version is signed off and released, other users can continue work based on the previously released version.

Once the changes have been made, the files are easily synchronised back with the master version. Even when a file is locked, the previously released data can still be used for reference. In addition, users can see when files of interest are updated. The latest official version of the data is always in the central repository.

Overcoming Poor Network Communications

Even with a "single version of the truth," poor network communications between the head office and remote sites can make it difficult to access data. It is not unusual for mining operations to be located in remote areas with intermittent and/or low-bandwidth connections and no guaranteed access to IT or other technical support. This can force the company to fly personnel/data to and from the site to ensure that models are properly updated and checked. One employee of a Perth-based mining operation, for example, told Gemcom that he flies to the mine's African site with a hard disk drive in his backpack to transfer data between the remote site and the head office. This was deemed more reliable and cost-effective than trying to use the available networking between the sites.

With Gemcom Hub, mining staff no longer require a direct, continuous connection to the central repository in order to share data. Engineers can now collaborate effectively no matter where they are located.

Hub enables users to work with data and collaborate globally.

A key requirement of the solution is an ability to handle very large files, such as block models. Discussions with Gemcom customers indicate that block models may occasionally exceed a Gigabyte in size; the need to transfer this amount of data back and forth to a server can severely impact the usability of an application. With Hub it is possible to send only the changes, resulting in a much faster "virtual" transfer of the file.

With an unreliable infrastructure, it is not uncommon to have a long data transfer interrupted, with the result that the entire process needs to be restarted. Hub uses break/resume techniques that allow it to detect the interruption and restart where it left off, rather than initiating a new transmission. This makes for a more robust transfer environment.

Accessing Data from Head Office

There are several reasons why Head Office may need access to on-site data. One is simply the difficulty some operations have in attracting senior, experienced staff to remote locations for extended periods of time. This can be further exacerbated when there are several such sites being managed by the operation. One solution to this is to host the more skilled, senior staff at a central location, and bring the data to them. This can be beneficial in that a single staff member may now be able to service more than one remote location. Though they may have the skills and ability to interactively steer daily activities, the poor communications may mean that they currently get used primarily as a more low-frequency checking mechanism, leaving the daily operations to run with less skilled local staff.

A large gold company with several operating sites recently told Gemcom that they have a real need to access site models and planning data from the head office. In their case, this task is currently performed annually by DVD transfer for presentation purposes, but the size and variety of the data makes more direct access infeasible with existing technologies.

Gemcom Hub makes it possible to keep large files synchronised with the live versions held at sites around the world. This has many uses for head office operations, ranging from the creation of annual reviews to the application of senior technical expertise to immediate on-site issues—without physically sending staff to the site. This moves the concept of centralised senior staff from being a compromise and alternative to having them on-site, to instead being a preferred work practice, with the ability to bring senior knowledge and experience to bear on issues at one or more remote operations in a timely manner.

Hub frees users from travelling to site.

Enhancing Productivity and Security

Other attributes of Gemcom Hub further enhance productivity and data management. The use of meta-data or "properties" helps users find the information they need, even if they do not know the specific file name or location. By knowing information about the file, rather than merely what it is called, users can locate data they may not have been aware of but which is relevant to the job at hand: "Find me all files related to Pit A that were edited on Monday."

Similarly, best practices in tagging data with properties makes it easier for other people to locate it in the future. Hub can help by enforcing the use of certain properties and/or assigning default values, depending on the type of data. For example, a user who wants to store a block model can select a predefined class that draws together the properties that are relevant to "model" file types, as defined by the administrator. Property assignment can grow, gradually adding value to the data as the meta-data becomes richer over time.

In order to maintain good security with remote users, Hub uses the standard SSL protocol employed by banks to secure online banking transactions. This, coupled with user login and role-based access rights, provides a secure environment for remote data transfers. Each data change is logged and the editor identified; every change (including a delete) is maintained on the Hub and can be rolled back if necessary. Users see only the data that they are authorised to access.

Hub has a very small "footprint" on the client computer. The primary role of the solution is to monitor changes to local files that may need to be synchronised, and to determine if any changes on the server affect the local user. There is no requirement for changes to the applications already in use within the mining operation.

Industry professionals have told Gemcom that the ability to "check out" a set of files from a project to update and modify offline (for example, while on an airplane)—secure in the knowledge that, when they return to the office, they can synchronise the revised files with the central repository—would be a huge benefit. Remote sites often require fly-in/fly-out of skilled staff, which is very costly. In addition to normal travel expenses like flight and hotel, there is also significant "dead time" during which staff lacks access to data and therefore cannot perform useful work.

The ability to update and modify files offline can save literally days of work. Hub makes this possible. And once a remote user regains connectivity to the centralised data, all files are quickly brought back into alignment.

Conclusion

The flexible Gemcom Hub works with any file type and tool set in common use at a mining operation. Gemcom has developed a solution to specifically address a major issue in mining environments, sharing large files over poor networks, with no requirement for an IT group to maintain it and make it work. Gemcom Hub helps the mine manage its most valuable asset—its data—more effectively.

The mining solutions you expect. From the people you trust.