BREAKING GROUND:
Automating IT workflows and processes in the mining industry

WHITEPAPER

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Executive summary

Like any industry, process is at the core of how mining companies function. From the intricacies of material extraction and regulations when opening a new venture to closing a shaft or hiring labor, processes ensure these activities are completed correctly, safely and responsibly. However, the nature of the mining industry also means there is often a disconnect between different parts of the business, leading to confusion and misunderstandings when completing these processes and, in turn, a lot of wasted time, energy and resources.

*In this whitepaper, we explore these issues in more detail, and explore how workflow technology can be used to streamline these processes and improve communication and collaboration across mining companies.*
Connecting processes and silos

There is a certain similarity between the physical workings of an underground mine and the way that mining companies work at an organizational, administrative level. Just as in a physical mine, in the office we find various ‘shafts’ which allow information, documents, people and innovations to circulate around the business. At the same time, we find various ‘seams’ where different teams and the information they work with are located. To illustrate this analogy, a ‘seam’ might be all the collected information, knowledge and activities held within an HR department or a project management team. Connecting these different ‘seams’ are various ‘shafts’—the processes which connect these different departments, such as requests for new hires, health and safety certifications, renewing onsite tools, training and so on.

If a mine shaft becomes blocked, time is wasted, money is lost and project delays will inevitably occur. If miners cannot easily connect with various seams it takes much longer to extract value. Similarly, if information and processes connecting different departments break down, the company becomes less efficient and resources are wasted. In essence, the challenge for miners is to ensure that processes can be as simplified and streamlined as possible, and that they can effectively connect different business departments and information silos so as to avoid these impediments.

INDUSTRY PRESSURES

It has been a challenging decade for the mining industry with a collapse in commodity values leading to slower growth. Recent years have seen larger companies close pits and smaller firms being forced out of the market altogether. These troubles are, in part, due to reduced demand from buyers (China, in particular, has seen demand for resources fall), yet there has also been the issue of over-supply by mining companies themselves.

Now is clearly the time for mining companies of all sizes to be bold and explore new ways of managing how internal processes are organized.
The heightened challenge of the mining industry

While the issues related to processes and information flows can affect any large company, the impact is particularly marked in the mining industry. Figures from Accenture outline how in less than twenty years, many mining companies have evolved from national or regional interests into truly multinational organizations. Not only do mining companies have a range of active mines and offices extracting an ever-wider range of minerals from the ground (often in far flung locations), they also work closely with a greater number of third parties, including:

- National governments and regulators
- Various international and regional organizations
- Material suppliers and buyers from increasingly diverse organizations
- Local subsidiary companies with their own cultures
- Contractors

The result of this growing diversity is that, on a business management level, mines face huge challenges when dealing with complexity, silos and consistency. Information flows around the business, from back office to head office to on-site and across national boundaries, which means that there are ever more silos and ever more potential for processes to break down.

In the next part of this whitepaper we will explore how both interrelated challenges—process improvement and information silos—can be mitigated by automating workflows.

3 TYPES OF PROCESS WITHIN A GLOBAL MINING BUSINESSES

1. OPERATIONAL PROCESSES
These can include any activities which support the company in its operations, including maintenance of machinery, management of suppliers or the smooth onboarding of new employees.

2. MANAGEMENT PROCESSES
These include the way management decisions are made, including the peer review process for strategic plans or initiatives to support team building.

3. LEADERSHIP AND CULTURE PROCESSES
These will focus on initiatives to create a common culture across the business and will focus on an array of activities including creating an internal communications strategy or the approval process for beginning major new projects.
Extracting more from your resources

As outlined in the previous section, mining companies are dealing with greater complexity across the industry.

This is largely for positive reasons—mining companies expanded massively during the commodities boom in the early 2000s, diversified their portfolios and dug pits in ever more geographically diverse locations. However, the downside has been a resulting increase in the risk of information silos, breakdowns in processes and the consequent waste.

By automating workflows and connecting silos in a more efficient manner, miners can achieve much more from their resources without having to compromise on their global presence.
What is workflow automation?

Workflow automation aims to boost the efficiency of organizational processes by automatically carrying out repetitive, often mundane tasks, freeing employees for more complex work, and removing the potential for human error within these internal processes. Traditionally, such processes that depend on people can easily break down for all manner of reasons—from an employee not seeing an email request to someone forgetting to check a safety valve or in a general business culture where people take shortcuts.

Workflow automation minimizes these risks by codifying these processes into automated systems which significantly increase the chances of tasks being done correctly and on time.

For example, most mining companies will have some form of scheduled machinery safety check. Without automation, such a process could easily be ignored or forgotten.

However, automated workflows make this much less likely to happen. The person in charge of the maintenance might be required to complete their safety check on an iPad and upload it to a central file repository. They would receive email reminders until they have completed the report and they would be compelled to complete it because management and due diligence teams would instantly be able to see if they had not filed reports as they are expected to. As well as that, other stages of the workflow would be unable to progress until the safety checks had taken place.

There is also the question of what happens when an inspection discovers a failure. Artifacts such as work orders need to be generated and engineers dispatched, among other operational duties. Workflows can ease the burden of these activities by easily automating notifications, task management and the creation of a complete audit history.

Workflow automation can play a major role in helping improve the two interrelated issues covered in this whitepaper: the question of breaking down silos and the issue of improving existing processes.
Break down silos with workflow automation

We already know that, in any complex business, information silos will inevitably arise. With offices and projects in diverse locations and employees with very different skill sets (and often speaking different languages), it is perfectly natural for information and activities to stay within departments. Unfortunately, silos also tend to impede the free flow of information, meaning it can take unnecessarily long to complete otherwise straightforward tasks.

Let’s illustrate this with a simplified example of how a major project—the opening of a new mine—can be held up by information silos. Excavating at a new site is a major investment for any mining company, and it requires the intense collaboration of many different departments.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Steps</th>
<th>Departments Involved</th>
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| 1     | Prospecting | Exploration teams researching potential.  
        |  | External companies providing resources and information.  
        |  | External governments to approve agreements. |
| 2     | Public Relations | Marketing/PR departments to explain the purpose of the mine and gain investment.  
        |  | Legal teams negotiating with government/local communities.  
        |  | Senior management to lead. |
| 3     | Gaining licenses to dig | Legal team to complete applications and comply with all legal regulations and environmental responsibility.  
        |  | Production and Project Teams to begin planning. |
| 4     | Beginning the dig | Production and Project Teams working together.  
        |  | HR to begin hiring contractors and workers.  
        |  | Operations to begin working on supply chain management. |

Of course, the above list is broad and highly simplified, yet it illustrates the point that for any mining project, different teams need to work together very closely. When information does not flow freely between these different departments, delays will occur.
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For example, in step 3, the legal team will be required to negotiate with local government about the legal implications of the project. If there is a hold up of some sort, this information needs to be immediately conveyed to the project management teams so they can put their plans on hold. If this does not happen, the project team could quite easily begin implementing their plans and even start hiring people before the project has even been given the legal ‘go-ahead’. This would, of course, lead to complications with the agencies that provide the workers, and could lead to going over budget or under-estimating project timelines.

Workflow automation would resolve this problem. If a workflow had been designed to define when the mine can start, the project team would only ever receive confirmation that they should begin their project when the legal team had ‘signed off’ the project. This means the above miscalculations would not happen.

HOW WORKFLOW AUTOMATION HELPS
Perhaps surprisingly, in many mining companies, the processes that underpin their work continue to be manual and fairly informal. While there is nothing inherently wrong with this, problems arise very quickly if teams in different departments forget to carry out important formal processes. When processes are left to be managed in an ad hoc manner, they risk breaking down.

Let’s illustrate by exploring the many different activities a mine manager is involved in every single day:

- Monitor conditions in the mine and ensure productivity
- Handle paperwork about operations of the mine
- File reports on safety and any incidents
- Setting up regular safety training sessions
- Be able to provide up to date information and documents to safety inspectors

Underpinning these activities are numerous, repeated processes. These include periodically carrying out checks, writing up reports, compiling data and organizing repeat meetings. Let’s illustrate this:

A mine manager needs to produce a monthly report on production at his site which is then sent to senior management. The process will include:

- Input of statistics on output
- A request for comment by a foreman on any incidents in the mine
- Input from workers or a union representative regarding conditions
- Lists of maintenance activities completed
- Lists of damaged equipment and any new orders placed
- Financial spreadsheets with input from finance teams
- A process for reviewing and editing the report

Managing such a report through its various stages is just one of the many processes which the mine manager needs to push through to completion every few weeks. Of course, this process can be left to complete itself ‘organically’, yet by automating the workflow the risk of breakdowns in the process is significantly reduced.
HOW WORKFLOW AUTOMATION HELPS

Once the workflow has been designed and implemented into the system, it can be simply set to repeat itself over and again. In the previous example, all the employees who need to add their contribution to the report would be prompted when the previous employee had completed their respective steps. If one person does not complete their step, they will receive reminders until their step is completed. In this way, the process is significantly more likely to be completed to deadline.

In this section, we have seen how automating workflows, both within teams and right across the company, can help break down silos while also radically improving existing processes. In the next section we take a look at a concrete example of how workflow automation can be implemented by using Nintex workflows.
UK-based GBM Mineral Engineering Consultants Limited designs and manages the construction of mineral extraction plants. They were using a legacy system to manage their complex project documentation processes, but this was cumbersome, slow and hard to scale. They implemented Nintex Workflow to streamline and automate their document numbering, metadata assignment, approval and transmittal processes.

A mistake in specifications when making and delivering orders for a customer can be hugely costly. An error can lead to the wrong piece of machinery being delivered to a site. Not only is this highly expensive, it can also waste a huge amount of time and lead to major project delays as the problem gets resolved – especially when the mine is in a remote location.

A highly efficient process for order management and approvals was needed, which would allow both customers and GBM to have a clear view over what had been ordered, and ensure every party had a ‘single version of the truth’.

For transmittals, Nintex Workflow automatically assigns a document number to any new drawing or specification, which is updated with each revision. When a document is completed, it enters an automated, staged approval process. Once approved, Nintex Workflow publishes the files to the firm’s extranet and emails a link to the client.

For GBM, Nintex Workflows have resulted in many benefits:

- Reduced risk of transmitting the wrong information
- Improved service to clients
- Easy customization of processes

Workflow automation can help improve processes across all facets of a mining company—from ordering products to safety tests and reporting.

“We must have complete certainty that our transmittals are appropriately controlled and issued, and using Nintex Workflow gives us that confidence.”

— Joe Russell, Engineering Manager, GBM Minerals Engineering
Canadian BGC Engineering is an applied earth sciences company that provides consulting services to the mining industry. The Vancouver-based firm’s experts provide recommendations to their clients based on data collected at often remote sites. Because internet connectivity is far from dependable at many operations, data collection and processing often had to be manual and paper-based. This opened up a multitude of risks around data reliability.

If data is not collected correctly or gets lost, BGC loses credibility and the trust of their clients—incorrect data can have huge impacts on the outcomes of customer projects. So, BGC needed a solution that would be mobile and would also record data in a dependable way, even when there was no internet connection.

Nintex’ solution automated the data collection process for consultants. Data could be collected and input on familiar consumer devices and then be automatically and securely uploaded to BGC’s SharePoint sites once a connection was made. The immediate benefit was that this cut the risk of any manual data entry errors and made data collection and analysis much faster. At the organizational level, it means BGC’s clients have much greater confidence in the reliability of the data the company provides and the decisions they make while using it.

“When it comes to the data I deliver, I constantly get questions like, ‘Are you sure?’ and with Nintex, I can honestly say, ‘Yes I am.’ Having these tools available gives me confidence in the information I’m collecting.”

– Annie Ruksys, Geological Engineer at BGC
As we have seen in this whitepaper, the mining industry is particularly exposed to the risks of process breakdown and information silos. Because mining companies are often multinational in form, incorporate highly complex supply chains and depend on many moving parts working together seamlessly, there are many potential points where these processes can falter. The industry itself is also facing many challenges, including a collapse in commodity prices, overproduction and low demand from major markets. In this context, we have argued that focusing on improving the efficiency of business processes and combatting the risks of silos will go a long way to helping miners save costs and increase efficiency.

**Workflow automation is a rapid, cost effective and highly impactful way of doing this.** By cutting the risk of human error and streamlining processes to ensure they are completed on time and to budget, workflow automation can play a significant role in helping businesses focus more on the content of their jobs, rather than chasing colleagues across various processes and getting bogged down in the tedium of mundane tasks.

For the business, workflow automation promises less waste, improved efficiency and the ability to create a leaner, more responsive organization. For business users, this translates as a reduced burden for ‘box-ticking’ exercises and the certainty that jobs will get done.

Ready to learn more about how **Nintex Workflows** would fit across your organization’s structure?

**Contact us today.**