Agile Mining at a Large Canadian Oil Sands Company
by Mishkin Berteig, Certified Scrum Trainer, Master of OpenAgile

Introduction

In 2007 my father Garry and I ran a public training course on agile project management. One of the participants, Darin Zandee, was a supervisor at a large oil sands mining company. He was excited by what he heard, but he was not yet in a position to try things out. By early 2010 Darin had been promoted but his team was having deep challenges with effectiveness. At that time, he invited us to help and we started a dramatic transformation in Darin's "Mining Projects" department. By the end of 2010, they had become a high performance agile team[1]. In the process they were able to cut millions of dollars from their yearly budget.

Background

In October 2007, Garry and I ran a 3 day agile project management course. We focused on Scrum, but also included some other techniques to enhance the learning experience. One of the attendees, Darin, had been invited by Garry after they had met on a canoe trip during which Garry had shared some ideas about agile. Darin was almost silent for the first two days of the course. On the third day, he became much more engaged and started asking about how to apply these ideas in his oil sands mining environment. He left excited to try some of the ideas, but uncertain if he would be able to make much progress.

Darin's work environment was very different from a typical IT/technology environment. Even if they are young, people in the oil sands mining industry are rough-looking, and have a very no-nonsense attitude. Everyone's life is on the line as they execute their normal duties. The scale of the physical work in the oil sands is much larger than most IT and technology environments. A single shovel-full of raw materials is about 100 tonnes. The haul trucks are huge! Just the truck's tires are three meters tall. Darin's annual budget was over one hundred million dollars. Work stoppages result in huge levels of lost revenue.

1 Darin's team used a combination of OpenAgile and Kanban as their agile approach.

Image from: http://farm3.static.flickr.com/2636/4141783657_f3920be786_o.jpg
Sourced from: http://commons.wikimedia.org/wiki/File:Mining_in_Mezhdurechensk.jpg

Darin's group was like the IT of Mining Operations. His group provided infrastructure and support for the ongoing mining work. Darin's projects ranged in size from hundreds of thousands of dollars for something that might be a few hours of work, up to billions of dollars for a couple of years of work. As well, his group worked twenty-four hours a day, seven days a week. Some of his supervisors did shifts, some were on regular office hours. The office facilities are rough, dirty and generally crowded. Walls are covered with maps and safety tips and warnings.

In May of 2008, Darin had an experience that reminded him of the agile training. This experience became a catalyst for transforming his own team. Darin writes, “I led a 65 day canoe trip from the Rocky Mountains to the Great Lakes (3,300km) in a 6 to 8 person canoe.... Each day I learned a new way to get closer to that 'One Team Feel'. We encountered the Canadian wilderness in all it's challenges and at the end of the trip we arrived on time, under budget, and no injuries. We had become one high performing

team.... When I returned to work I craved that one team feel because it felt so empowering."

Darin contacted us to see if we could help. With some logistics out of the way, we began with some basic assessment and training for his team of supervisors.

Implementation

In April 2010, we began learning about the team's circumstances. One of the biggest challenges was related to communication across shifts. Any time there was a shift change, there was a great deal of pressure to do the change quickly so that the mining equipment would not sit idle. This was called a "hot change" since the equipment was not turned off. In Darin's team, the shift change often resulted in errors and rework due to a lack of effective communication between the shift supervisors and their staff of equipment operators. Even a small error would cost tens of thousands of dollars, and errors that had a safety impact could result in people losing their jobs.

Another large challenge was with the schedules for some of the larger projects. These larger projects often had important ramifications for the mining operation. A late project could have a business impact measured in millions of dollars lost per day. When we started working with Darin's group, there were two major projects that were already projecting late deliveries of more than a month.

The problems with shift changes combined with the pressure of the late projects had created a dynamic where there was a great deal of dis-unity among the supervisors in Darin's team. Angry outbursts, finger-pointing, apathy and discouragement were all common. Darin had a vision that his team could become like the team on his canoe trip, but things were currently in bad shape.

As we spoke with the members of Darin's team, it was obvious that there was willingness to work together to improve things. As we talked about the agile process, roles and principles including honesty and transparency, continuous improvement, teamwork, we could see that these rough individuals all desired to have a better work environment, and while there was scepticism around the "softer" parts of agile, they were willing to give agility a chance.

The first step we took was to help Darin create and evolve a task board. There were two logistical challenges. One was that there was no suitable space to create a team room. The second challenge was the lack of common hours where all of his supervisors would be able to meet on a regular basis. The best we could do was to use Darin's small office as the team HQ and set up a large whiteboard as the task board. Over the course of a few months, the task board evolved from a fairly simple set up to a sophisticated, active

display of all current work in progress.

Even before it was in its final state, the taskboard became a focal point for team communication. The supervisors doing the shift change would meet around the task board, similar to a daily Scrum meeting, to summarize the work of the shift just ending and make tactical plans for the next shift. This simple application of transparency created a much more collaborative environment between supervisors and had immediate benefits by reducing errors and rework, and sharing learning.

One simple example of this is instructive. During one of the shift cross-overs, the outgoing supervisor shared a technique for using a grader in a way that hadn't been done before. As a result, the two supervisors were able to save $50,000 over the course of a few hours by avoiding the use of more expensive equipment and contractors to do a job. Prior to using an agile approach with the task board, this same shift change would likely have resulted in rework, errors and arguments about how to do the work and ended up costing a substantial amount of time (and money) instead of saving money.

In general, the sense of team cohesion increased rapidly and dramatically over the course of a few months. In part this was spurred by the visibility of work, but also by some other agile practices related to goal-setting, iterations and continuous improvement.

Early on in our work with Darin, we helped him understand and articulate the goal of his group. Then we helped him to communicate that to his team members in a way that would be constantly visible and motivating. This visioning work was then directly tied to the projects, objectives and value drivers (like product backlog items) and made

visible on the task board. The six corporate high-level values were “Improvement”, “Community”, “Reliability”, “People”, “Safety” and “Environment”. Each of these values was considered a category for accountabilities and goals, which then became detailed items of work – the value drivers and tasks. It was surprising to see such a complex task board evolve, but in retrospect it is understandable given the scale of Darin's work.

Darin was also able to help his team put in place some other agile practices such as iterations for planning and learning. These weekly iterations focused on the learning process and planning was more informal. An attempt was made to record learning in a spreadsheet, but this proved to be cumbersome for team members. It was neither visible, nor simple. Instead, learning was best done as an verbal/aural process. Planning, while informal, did have a focus. A great deal of detail project planning related to the engineering work was done outside the group. So Darin's group focused planning on their team-related work: skill development, team goals and objectives. For example, on the mine site safety is foremost in everyone's minds. So their planning included discussions about improving safety.

When we first started working with Darin, he and his supervisors were somewhat sceptical about our vision of how much cross-training could be accomplished. As the months passed, this vision became more and more real. At first, the task board and planning process were very focused on <u>who</u> would do which tasks based on individual roles and responsibilities. The visibility of the work and the systematic sharing of learning through the iterations gradually changed this. Eventually, all the members of Darin's team were able to easily take on tasks from the others' traditional responsibilities. As Darin has written, “All eight supervisors can step into each other's role even with the high complexity of work and 200+ employees.” This process of cross-training became so effective that there were two surprising outcomes: onboarding new team members was just a matter of minutes instead of days of confusion, and training “upgrades”, the systematic development of staff to become supervisors, was far quicker and far less painful then in the past.

One really clear indication of the team taking ownership of the process was the development of “trump” cards. On the mine site, weather can have a significant effect on operations. If roads become slippery from rain or snow, haul truck drivers must slow down. Slower haul trucks have a direct measurable impact on revenue! One of the responsibilities of Darin's team is to maintain the roads in the case of a weather problem. This is mostly a matter of getting sand onto the roads. Given the scale of the site, it was normal for the team to take several days to completely recover from a weather event. The team created special large red cards with the words “rain” and “snow” on them. In the case of a weather event, one of these cards was put prominently on the task board over top of the other tasks to demonstrate that responding to a weather emergency was

the only priority to be working on. Just this simple visual indicator, along with the learning that had been part of their agile environment was enough to reduce recovery time to a few hours. This was a huge win for Darin's group.

Sustaining

Two significant events in the fall of 2010 had a large impact on Darin's team and showed the power of agile and the cohesion of their team. The first was the sudden and severe illness and death of one of the team members. The second was Darin's next promotion.

Darin's own description of what happened when his blast supervisor, Pat, fell ill is the best way to share this story:

> 10:00 AM: The phone call from Pat with a lung cancer diagnosis drops into Darin's world. He has to figure out what to do in short order.
> 10:03 AM: While his brain spins he calls HR and his Director to bring them into the loop.
> 10:10 AM: Darin takes some stickies and writes on each one the deliverables that Pat had and the value drivers they were related to. He took these stickies and connected them to others with existing capacities already on the task board, where each person had a unique color of stickies.
> 10:15 AM: Then he called the blast planner, and blaster into the room and had everyone help move all the stickies in terms of capacities.
> 10:30 AM: Priorities aligned and coverage figured out.
> 30 minutes = elapsed time to solve the problem using the OpenAgile Task board and team. [Director] came in and moved a few more stickies around and saw the value of the method in short order.
>
> Another Day: HR books 1 hour meeting to build dual blasting role.
> 11:00 am HR and Darin search for excel spreadsheet and talk about format.
> 11:15 am Darin shows HR the stickies on the wall. Darin grabs two colored markers and split roles into two by red X or green X.
> 11:20 am HR transfers this data to his print out with an O or F (Office & Field)
> 11:25 am HR leaves and Darin takes a picture and emails it to James so he can break out his sheet into more detail.
> 10 minutes = elapsed time to solve the problem using the OpenAgile Task board.

Pat passed away shortly after his diagnosis of lung cancer. This was a sombre moment

in an otherwise exciting time for Darin's team.

Darin's team was so successful with their duties that Darin was promoted again. To replace him, Tom, one of Darin's team members, was promoted. With this promotion from within, there was a real chance for the agile approach to continue unabated. However, most of our work and most of the initial drive for agile had come from Darin. As a result, Tom was not completely comfortable with his own ability to sustain the agile process and teamwork. Gradually, the task board became a little "stale" - all the other team members were waiting for Tom to lead them and encourage the use of the task board. Darin was so busy with his new duties that it took a while for him to notice, even though he was still in the same office building. When he did notice, he encouraged Tom to speak with the team. Out of that discussion, one of the other supervisors became very excited – he was willing to help facilitate the process – and started to encourage everyone to keep using the task board. This encouragement and excitement has continued to this day (July 2011).

In the meantime, Darin has gone on to use agile in other parts of the organization... a story for another time!

Results

Overall, the results of using agile in Darin's group, even without doing "perfect" agile, are quite substantial. There are two significant aspects of the overall results: financial and human.

Darin was able to save around ten million dollars and give that part of his budget back to his VP. That figure does include savings from some other initiatives, but all of them were executed in the agile framework. Darin has given agile the credit for his ability to execute effectively on his accountabilities. The savings come from a combination of real savings such as avoiding the use of contractors for planned work as well as cost avoidance through reduced errors and rework. There are also enormous cost savings for the entire mining operation that measure in the hundreds of millions of dollars. One example of this is the much-improved response time to weather events. Another is getting the major projects back on track for timely completion. Another was changing plans to create a shorter road, thus saving every haul truck time for the lifetime of that road. These may seem like small things but with productivity so dependent on the mine infrastructure, these changes have very large dollar results.

The human impact of agile was also tremendous. At the six-month point in the adoption of agile, we held a status review with Darin's team. Everyone was clearly in good spirits. The team was united in their vision, and had come to a point of capacity that none of them had imagined just six months before. One of the supervisors made a

powerful statement. This supervisor, Curtis, was close to retirement. He told us that he wished that agile had come to his group years ago... he didn't want to retire any more!

Future

The future of agile at this mining company is bright. The success of Darin's team and his subsequent promotion have helped to propel agile thinking and behavior into new areas. Darin's management are considering the use of agile. Other supervisors and superintendents are starting to use task boards. And Darin is taking agile with him to his new responsibilities.

Conclusion

Agile methods emphasize teamwork, visibility, and continuous improvement. Darin's team grasped these concepts and applied them to great effect in the mining projects work they were doing. The results included direct savings of around ten million dollars per year, and much more in indirect savings. As well, team morale and staff engagement were dramatically improved. Darin's vision and leadership transformed a struggling department into an example of efficiency and effectiveness for the rest of the organization.