



**Knowledge-intensive mining  
24 August 2009**

I have addressed the issues in the previous couple of articles about the poor use of knowledge and value adding through innovation by the Australian mining industry. I have been quite negative about how the Australian mining industry is performing in this essential area. So rather than always be negative, the aim of this article is to describe a process and a culture which will form the foundation of improved performance through knowledge-intensive mining.

With some hesitation I return to University and 1<sup>st</sup> Year Chemistry. We consider a reaction with a desired result. The chemical reaction requires reactants and a catalyst. To achieve the desired reaction (adding value through innovation) we need the correct reactants (processes) and catalyst (culture)

If you knew that there was an M8050 dragline that achieved 21 MBCM annually (17% higher than the next best), would you want to know how? If you knew there was an EX5500 excavator which achieved 12% higher than the next best, would you want to know how? Most people do and this type of broad information is the foundation of knowledge-intensive mining (but it doesn't stop at the broad-based information). The following definition is proposed for Knowledge-Intensive Mining.

*Knowledge-intensive mining is the acquisition (from internal or external sources); absorption (through active understanding) and application (via systemic processes or one-off projects) of knowledge which improves the mining process.*

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The steps to gaining the tangible improvements, whether they be due to a change in the machine or mining process, must be preceded by a number of steps of gaining the intangible knowledge. Each individual needs to be accountable for their own attitudes and actions, regardless of their position. Not everyone keeps detailed records of everything he/she does, recognise some form of sub-optimal result, does something different, etc. What is needed is people doing business improvement on a “micro scale”. What that means is when a person sees something happening which is sub-optimal they immediately do something to change it. For an operator an example might be a half full bucket or poor positioning on a block. Improving this doesn’t take a BI program but if you look at it, a very similar (undocumented) quality / six sigma / lean process is taking place. To achieve these gains you don’t need a BI program, you need a focussed and motivated workforce / team. To get this you need the processes and the culture. Each person up the management line, Operator, Foreman, Supt, Manager, General Manager, etc. needs to take this micro approach to business improvement and it appears clear that many are not. All too often the upper level manager is too concerned with “ticking the boxes” and / or not making a mistake to worry about really using knowledge to achieve innovation. After all, their performance is normally judged on how many mistakes they have made, not how innovatively they have acted.

Whether work is in coal mining, hard rock mining, infrastructure, environment, or wherever, the messages are the same: Firstly, the idea that only tangible things add value must be changed. We must value knowledge. We must actively acquire knowledge, absorb it and apply it to add value through modifying processes. Remember, processes are the innovation reactants. They are the aspects which combine to produce productivity.

Changes to them are sometimes  
hard to grasp or understand but they

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are none-the-less the fabric of performance. Secondly, culture is the innovation catalyst. Not change for the sake of change but rather change which is targeted at the bottom line.

So what do we do about culture? This is the more difficult question at all levels of the mine but if we look at management there are two key issues to do with culture. Firstly, the attitude of rewarding people who don't "stuff up" must be changed. If you aren't allowed to be wrong then your employer won't ever achieve anything. Companies must reward people who are prepared to take measured risks even if those risks fail. Anecdotally, it is smaller companies which encourage innovation but they don't always respond well to failure so their support of innovation is not always useful. If you are rewarded for not "stuffing up" or if you work for a company which describes itself as a "fast follower" then find another company which encourages innovation. Secondly, you must believe you have a right to be wrong. If you as an individual aren't prepared to be wrong then you won't ever achieve anything. Unfortunately our education system, which I admire greatly (I am married to a teacher who I met in a small town in the middle of nowhere), encourages people to be right. There is little encouragement to be innovative and get it wrong.

It is these attitudes (or lack of them) which is strangling the advancement of the Australian mining industry.

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