

The best mine of today™ Richard Roberts reports

The tag, "mine of the future" has developed a real buzz around it since one major miner tried to turn it into a trademark. This company and others, though, could get a lot more mileage out of being the "best mine of today".



That's the view of a number of experienced mining consultants and technical advisors, none of whom doubt the potential for automation and other new technology to produce steep improvements in mining equipment utilisation, and maintenance cost reductions, in future. However, they point out the gap between today's industry best practice performance levels for, say, mining trucks, and shovels, and the norm (note, not the worst) is too great to ignore.

"Best practice mining trucks are 52% better than average [and] best practice excavators are 41% better than average ... so it seems to me that the step changes desired by companies such as Rio Tinto are staring them in the face and they can be achieved with the same mining trucks and loaders they are using today," one Queensland-based mining engineer told this reporter recently.

"Wouldn't it be great if they [mining companies] actually started using their trucks, loaders and other equipment to its potential – it is called asset optimisation and the facts suggest most companies don't get it – and then build any further step change from automation and other new technologies off that?"



The sentiment is echoed by veterans of the mining industry across a range of professional fields – many of them, admittedly, now on the supply of the fence. However, it is clear most genuinely believe in the industry's capacity to be smarter and better at what it is currently doing even as it seeks out elusive "step changes" in methodology and technology. Why?

"Because other industries – such as manufacturing, and oil and gas – are already doing it," the managing director of a major international mining IT company said.

"There is no question that operating costs have increased dramatically almost across the board in the Australian and international mining industry," a senior mining consultant, John Buffington told me. "The obvious causes are more difficult mining conditions, and increases in fuel, labour and consumable costs. However, on a cost per unit basis the other factor in the equation is productivity.

"Productivity issues come down to a number of factors: a good strategy for equipment selection, operation and maintenance, good day to day utilisation of equipment and labour, and well trained operators and supervisors. It's the holistic approach to business management that wins in the long run."

Dr Graham Lumley's Brisbane-based firm, Ground Breaking Innovations (GBI), claims to keep exhaustive records of standard mining equipment operating levels and annual production rates in the field, around the world, such that it can advise miners and contractors on benchmark performance, average and "real" rates that can be expected for all types of equipment commonly being inserted into mine plans, and then into real mines.

"There are some amazingly smart, technologically-advanced tools available for mine planning," Lumley says.

"However, many mining operations have been continually hamstrung by mine plans which don't provide the expected results. Mine planning is a multi-faceted science, which simply means that despite the technologically advanced tools there are still multiple places where it goes wrong. As with all modelling processes, the output is only as good as the input data – both geological and asset performance.

"The cliché, garbage in, garbage out, is alarmingly prevalent with mine planning."

Lumley said at the 2009 Australian Mining Technology Conference in October that significant sums of capital were invested in plant and equipment at new mines on the basis of productivity and utilisation numbers that were, at best, optimistic and, at worst, not compiled according to standards currently required of geologists and their masters reporting under JORC guidelines, or metallurgists tallying their numbers under the auspices of the new industry metal accounting code.

"Part of the reason why people plan for exceptional performance lies in the belief that Australian mining companies deliver exceptional performance when compared to the world stage. Many believe that 21st century opencut mining in Australia or when done by Australian companies is a mature and efficient exercise," Lumley said.

"It might be mature but it is certainly nowhere near as efficient as it could be. This is despite the significant improvements achieved over the last 20 years which have come about through the reduction of restrictive work practices and structural change in the industry."

"Shareholders have been told that Australian opencuts are now among the most efficient in the world. But the bottom line is the average mine or contractor is not doing the right thing by their shareholders and utilising the very expensive equipment at anything like best practice productivity. They have cut worker numbers substantially, which has created the illusion of efficiency through improved output per employee, but the average mine is underperforming annual output across their equipment fleets by 20-50% depending on the equipment."

"Mine plans have been created using assumed maintenance haul truck costs of \$A22/hour below actual, and assumed maintenance excavator costs of \$A75/hour below actual. Input costs are also being significantly underestimated. For example, fuel burn on trucks assumed to be 37 litres/hour below actual, tyre life assumed to be 2500 hours above actual, and labour being costed at \$A55/hour below actual."

"Clearly there is something wrong with the planning and/or the execution of the plan. Substantial underperformance is rife."

"Most serious of the impacts are the effects on margin ranking to establish resources estimates and cash flow estimates to value the mine operation."

According to Lumley, the "theoretical capacity" of equipment should play no part in an assessment of planned performance as part of a future mine plan, yet "it is a fact that young, inexperienced engineers do tend to use the theoretical capacity in planning models".

"In many respects, this is safe," he said.

"Firstly, it looks good in the financial assessment. Secondly, other factors often change before the mine plan is put into place – for example, geologic reserves and cut-off grades, commodity prices, etc – and finally the fallback position of 'the ramp-up in performance is taking longer than planned' can always be used."

"These factors combined with the reticence of mining analysts, senior management and boards of directors to hold people accountable for the effectiveness of plans, encourages people to be optimistic."

"And from a mining consultant's point of view, a good mine is easier to sell than a bad one."

If companies could be encouraged to be more realistic in their assumptions, more accurate predictions would naturally follow.

And perhaps the current fixation of some mining companies with a 'mine of the future' might become a more rigorous competition to be the 'best mine of today'.

* Richard Roberts is editor of www.highgrade.net

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Contact: Richard Roberts
 Phone: (08) 9230 0101
 Email: richard.roberts@highgrade.net

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