

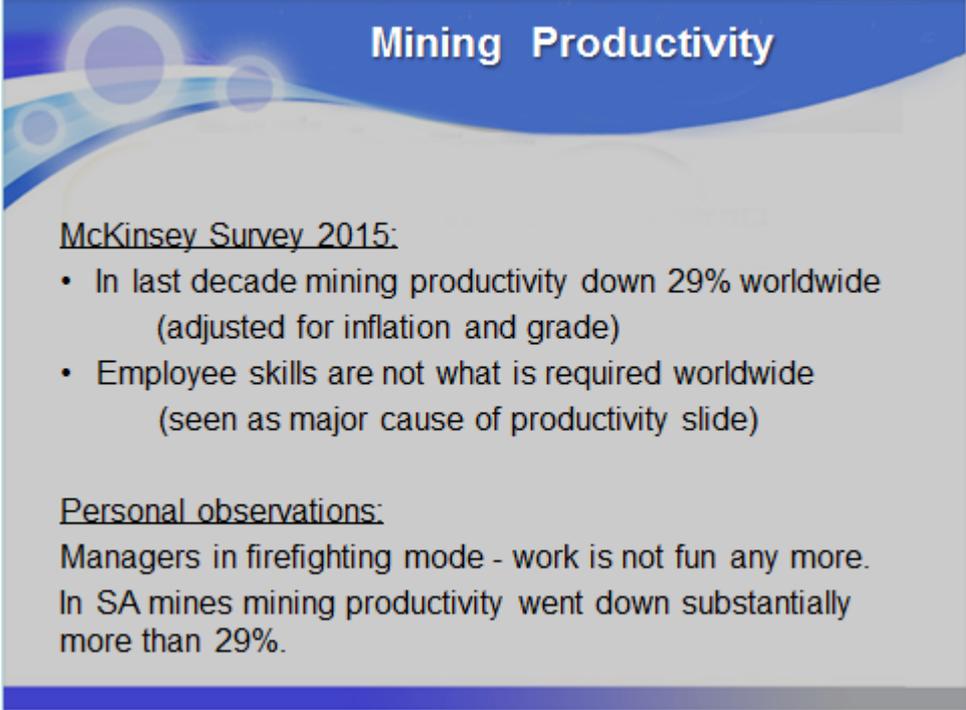
A leadership intervention for mining- The Productivity Platform

Increasing Mining profitability and employee engagement in times of financial stress

The following is the transcript of a lecture delivered at the Wits Business School on 11 August 2015 by Hendrik Lourens:

The problems we face and some anomalies

It is official; mining productivity is sliding at a time when commodity prices are falling. Billions of dollars in mining market value have disappeared. A recent report by McKinsey “Productivity in mining operations: Reversing the downward trend” and one a few years earlier by Deloitte, “Mining Spotlight on: Sliding productivity and spiralling costs”, details some of the reasons for this state of affairs. Both articles make valid points, except that the elephant in the room is not mentioned, not even once. It is our view that the root causes of this state of affairs go deeper than most analysts believe. Aggressive cost cutting over the last few years of the down cycle seems not to have been enough, in many cases cost per ton has actually increased and employee engagement seems to have decreased even further.

A presentation slide titled "Mining Productivity" with a blue header and decorative light effects. The slide contains text about a McKinsey survey and personal observations.

Mining Productivity

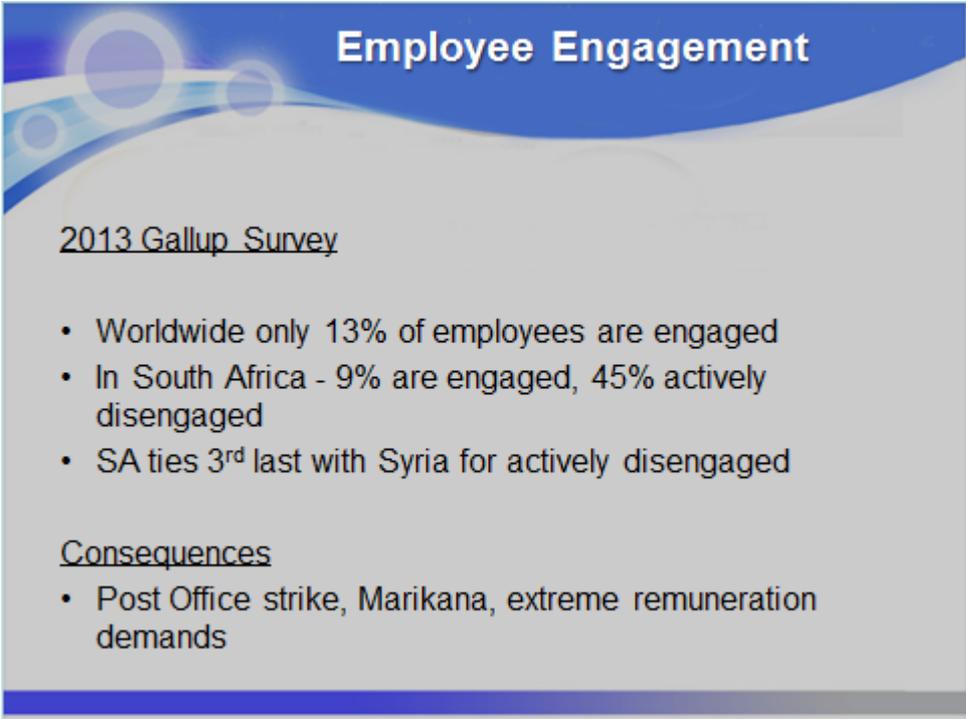
McKinsey Survey 2015:

- In last decade mining productivity down 29% worldwide (adjusted for inflation and grade)
- Employee skills are not what is required worldwide (seen as major cause of productivity slide)

Personal observations:

Managers in firefighting mode - work is not fun any more.
In SA mines mining productivity went down substantially more than 29%.

In South Africa we also have to deal with actively disengaged employees, to a much greater extent than elsewhere. Actively disengaged employees are looking around to find ways to damage your business.

A presentation slide titled "Employee Engagement" with a blue header and decorative circles on the left. The slide contains two sections: "2013 Gallup Survey" and "Consequences".

Employee Engagement

2013 Gallup Survey

- Worldwide only 13% of employees are engaged
- In South Africa - 9% are engaged, 45% actively disengaged
- SA ties 3rd last with Syria for actively disengaged

Consequences

- Post Office strike, Marikana, extreme remuneration demands

At the same time government is strengthening its commitment and enforcement of safety standards. Managers often feel like they need to be magicians pulling rabbits from a hat in order to maintain profitability under these circumstances.

Would you be happy if the rabbit out of the hat looks like this?

In more than 70 implementations of what we call the Productivity Platform we have seen production increases of between 7–50% and cost reductions of 10–30% per ton. The intervention typically delivers within 5 months and production increases in the following ranges:

Breakthrough results in mining with Scrum Production Flow

Production increases achieved in 3 months

- Underground Deep Level Gold Mines, (+20% to +40%)
- Open Cast Iron Ore Mine, (+20%)
- Underground Chrome Mine, (+30%)
- Underground Platinum Mines (+20 to 30%)
- Open Cast Gold Mine (+20%)
- Underground Copper Mines (+20 to 30%)

And some exceptional production results

- Shaft at underground Platinum mine, 2014 (35%) in one month with new manager.
- Underground gold mine Shaft 4# (+60%), Shaft 7# (+55%), Shaft 5# (+50%), Open cast Platinum mine (+45%)
- This should not be possible, what are we missing?

(These results were obtained over the last 15 years by Arrie van Niekerk of Tavanec. The methodology is called TOC Production Flow or the Productivity Platform)

Can you imagine the effect of these productivity increases on the bottom line? For a mine doing just better than breakeven the impact is a multiple increase in profitability. Some of our clients believe that the improvement in engagement of managers and workers are just as important.

Does this seem too good to be true? If the Productivity Platform methodology can generate these results in so short a period, why do most mines run so far below potential? How is it possible that clever and experienced managers using best practice can produce results day in and day out so far below what is possible? And that they believe that their employees are of low ability when we will see later that this is not the case.

In part 2 we discuss these issues in more detail.

HOW CAN I BE SURE THAT THE PRODUCTIVITY PLATFORM WILL WORK FOR MY MINE?

There is a simple method to see if you suffer from stop start production flow.

The graphs below show before and after production numbers for an open cast mine. Notice that the average production rate is about 60% of the proven process capacity. By implementing the Productivity Platform system, the average output increases from 12000 tons per day to 16000 tons. Note that no de-bottlenecking has occurred, the change comes from the mean of the process running closer to proven capacity. This delivers a 25% output increase for the same cost.

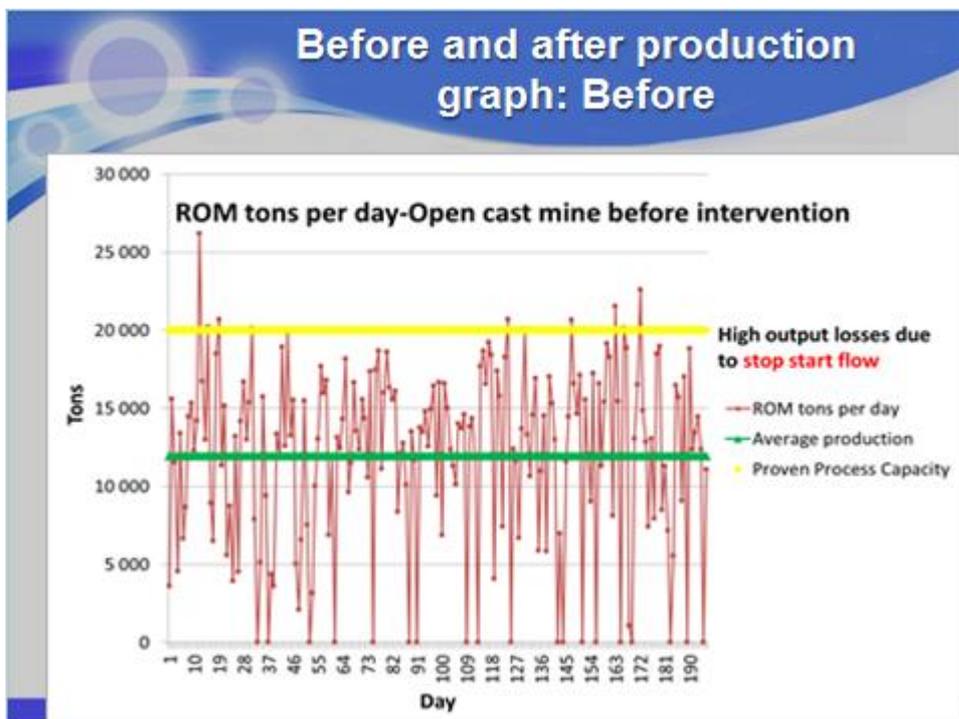


Fig 1: Average production 60% of capability

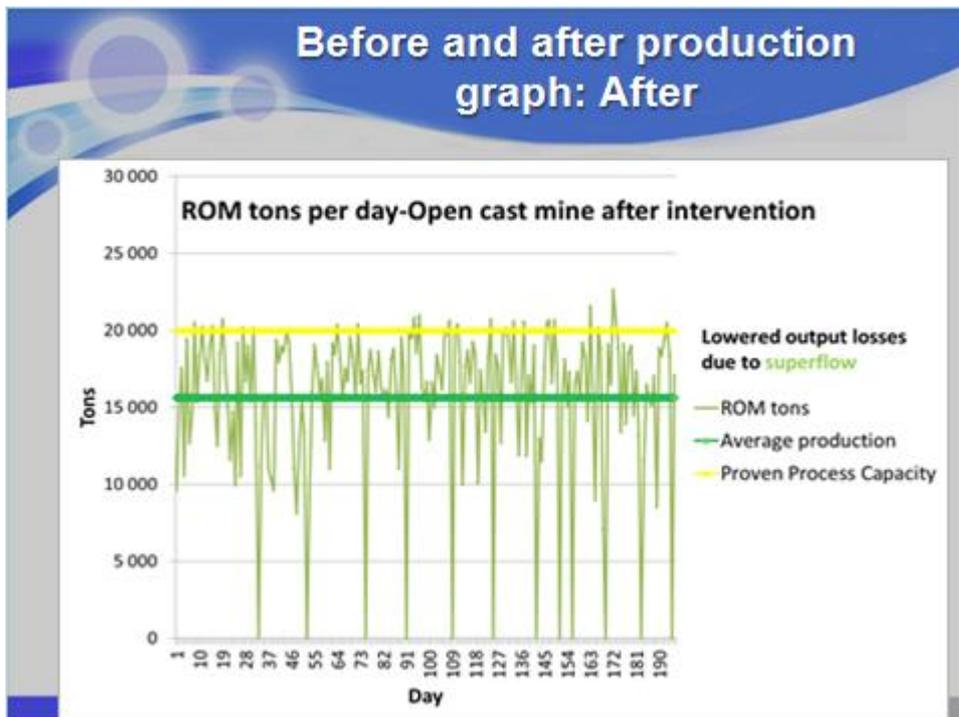


Fig 2: Average production 80% of capability

The Productivity Platform intervention will deliver results in situations where the average daily production is as high as 75% of proven capacity. At this level, about 20% extra production can still be obtained, in the space of a few months.

So before we look at the recipe for pulling rabbits out of our hat, let us discuss the elephant in the room.

The Elephant in the Room- Leadership in times of financial stress

Mining profitability is under pressure, not just because of the sliding commodity prices but also because productivity has decreased drastically over the last 10 years. The focus on improving financial performance (driven through efficiency measures) is much stronger than years ago. Enterprise Resource Planning Systems such as SAP is considered essential in this drive. At the same time workers are disengaged and unions are becoming more militant. Safety standards and requirements are higher than ever before and enforcement is strict.

Mining Managers are busier than ever, trying to keep all the parts of the business under control.

Any ideas on how to address these problems? Does the problem perhaps relate to our unskilled workers, militant unions, high electricity prices, decreasing ore grade? No doubt all of these factors contribute, but in our experience the problem runs much deeper. It relates to managers, at all levels of the organisation, who find it difficult to provide appropriate leadership. Leadership behaviours

that were effective a decade ago might be unsuitable presently. The reason for this is that leaders have to adjust what they do when the environment changes.

What do we need to provide good leadership?

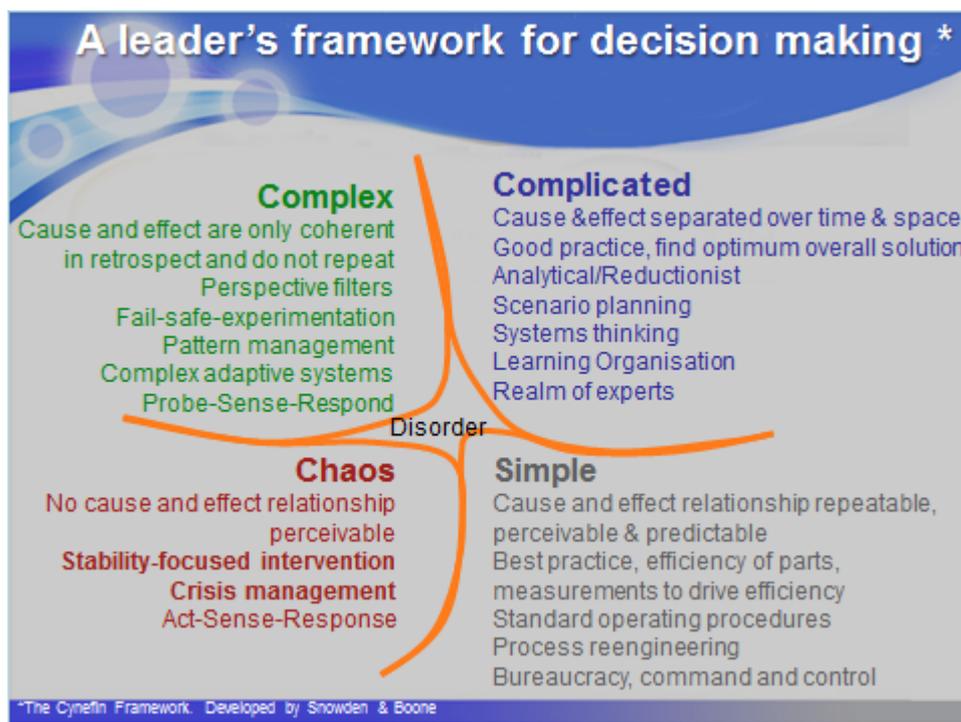
So how do we ensure that we have effective Leadership in times of change? Here is a definition of leadership that I like very much.

“Leadership is a process which creates an environment in which people want to perform. It excites employees and inspires them to focus on the interests of the group and the organisation.”

Immediately we have to ask “What is the best interest of the company? And, “How do we ensure workers want to perform?”

A Leader’s framework for decision making

To answer the question around “best interest” we use the CYNEFIN framework.



The actions that are in the best interest of the company depend on the environment the company is operating in. In 2007, Dave Snowden published “A Leader’s Framework for Decision Making” in the HBR. It won the best paper award for that year. He called the framework Cynefin.

According to the Cynefin framework businesses may experience conditions related to 5 different domains: Simple, Complicated, Complex, Chaos and Disorder.

To be successful managers have to adapt their strategies to the reality of the environment they face.

For this discussion we will look at the simple and complicated domains only, although the complex domain is also in play, especially around human interactions.

The simple domain is the domain of best practice. To be successful in this domain we should ensure that we measure the efficiency of each machine and person and force continuous improvement onto these. Cause and effect is simple, reproducible and everyone agrees as to how best to perform certain tasks. As a result the command and control, vertical coordination management style works well here.

The complicated domain deals with good practice, many solutions are possible and it is not clear which of these are the best. Cause and effect is separated by a time delay and only those who work close to the issues being faced (experts) can make sense of it. In this area systems thinking leads us to the best results. Systems thinker Russell Ackoff put forward two important guidelines for managing systems, a) if we optimize a system we will have parts of the system not optimized, b) if we try to optimize the parts we will have a system that is not optimized. Striving for maximum efficiency on every part of the production chain will cause suboptimal results. To obtain the best results in this domain we have to manage the pattern of relationships, not the parts. Decisions need to be taken closer to the action and faster, by those who understand what is happening best. These employees should be empowered to coordinate their actions horizontally, with managers being enablers rather than controllers.

In reality mining managers manage situations that are mainly in the complicated domain (parts are in the simple and parts also in the complex). Why do I say that? The effect of geology, equipment availability and personnel on the production flow for each mining cycle cannot be predicted in advance. At the same time all the production departments in mining and processing are tightly interconnected and interdependent. For example the quality of drilling work will have an effect on the blast quality which will with a time delay affect load and haul departments.

But the financial pressures, the relative inexperience of many managers involved in mining, and the ability to quickly obtain detailed efficiency measurements and cost data on each factor of production have conspired in such a way that most mines are being managed as if the managers are facing problems from the simple domain. In order to manage this way managers have to try and force certainty on situations that are inherently uncertain.

The hierarchical structure forces mid-level managers and workers to pretend that reality corresponds to measurements and long-term plans. To survive in this environment employees hide critical information from colleagues and superiors; blame shifting becomes the survival method of choice. No one has an overview of the system as a whole or of how actions of departments are taking the company towards the goal. In addition, employees are blamed and rewarded for events over which they have little control. Teamwork and trust cannot exist under these circumstances. Little wonder employee engagement is poor.

This is also why management is being overwhelmed with the need to constantly coordinate and control every aspect of mining. Many hours are used up by meetings that do very little to improve the production flow. The fact that production departments are tightly coupled, interdependent and subject to extreme variability does not enter into the best practice management model. When production ends up well below historic norms, process engineering, standard operating procedures and performance of the factors of production are driven even harder. This is done by strengthening

top down coordination and control with the help of more computer generated data. In this manner both mine managers and their heads of departments are disempowered. After a while, with results deteriorating further, head office starts to decide what interventions are required on the mine. In the minds of mine managers the production volume KPI slips in importance, and diametrically opposed KPI's (efficiency measures) rise.

Unfortunately data cannot capture the interdependencies and patterns of relationships between departments. Hours spent every day going through the efficiency numbers of the previous day does not tell us what to do differently tomorrow.

Analogous to this behavior is the image of the captain of a ship standing at the stern and analysing the wake of the ship. What is needed is for him to be at the bow steering the ship towards its target.

How efficiency measurements lead us astray and destabilize Production Flow and Employee engagement

In the early 80s Eli Goldratt developed the Theory of Constraints, a type of systems thinking. One of his favourite sayings was "If you tell me how you measure me I will tell you how I will behave." Many years of experience in manufacturing and mining have shown us how true this statement is.

He also spoke about our need to be efficient in everything we do as a major cause of our problems in a systems environment. He made a distinction between what he called the Throughput and the Cost World thinking. In the Cost World we believe that every extra bit of efficiency we can achieve in any part of a system leaves the overall system better off in terms of profit. In the Throughput World we know that we should focus on improving the efficiency of the bottleneck departments only and that efficiency improvements in other departments often cause the overall flow of the system to reduce. This thinking is in line with Russell Ackoff's guidelines mentioned earlier.

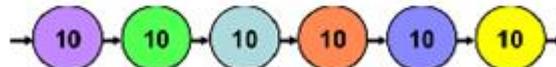
We will now briefly discuss some aspects of our line of thought that leads us into making sub-optimum decisions when we try to reduce costs.

The following simplified example highlights the main issues faced in production. The goal of this exercise is to set up a cost-effective chain of 6 production departments to produce an average of 10 units per time interval. We consider the running costs of each department to be proportional to its production capacity. As the department produces it will hand over product to the next department.

From years of dealing with clients in mining we find that the picture below is considered to be the ideal configuration by most people when trying to design an efficient and cost-effective production chain. Each department is set up to produce an average of 10 units per time interval. We call this a balanced capacity chain.

What are we missing?

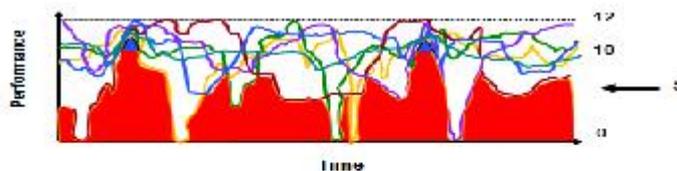
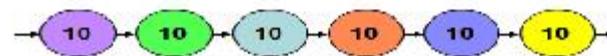
Practice run:
Set up a production department with 6 units capable of producing 10 units per time interval, at highest efficiency and lowest cost.



In this chain all resources will be busy and run at high efficiency. Our management system rewards this design. We believe that it will produce an average of 10 units per time interval at the lowest running cost possible.

However, the reality is different, since these resources are interdependent and suffer from variability in output.

How efficiency measurements lead us astray



The average output for each resource per time interval is 10, but contrary to our intuition the output is not a Gaussian distribution. Sometimes the output falls to zero. In this example, our effective output is the lowest output of any of the departments at a given time. If blue goes down, all units upstream are blocked and those downstream are starved. The effective output is only 5 units, although we have resourced for 10.

The manager in charge of this chain has a big problem. Whom does he hold responsible for the shortfall in production? Whom does he reward for good performance? In addition, where is the bottleneck he should focus his attention on? What will the inter-departmental relationships be like? What will the company culture be like?

If we change the time scale at the bottom of the graph to a month, the time interval to a day, and assume that daily production meetings will be held, what is likely to happen? When daily production exceeds 10 tons the manager could call his subordinates together and tell them: "See, you always complain that you do not have enough resources, but you can do it! Now go and do that again tomorrow." But tomorrow one of the departments goes down and the output is terrible. Whoever is in charge of the department that goes down is now on the red carpet and half an hour is spent telling him or her how to do their jobs better. When asked where the bottleneck is everybody will have a different idea based on what they remember and how painful the breakdown in question was.

Eli Goldratt believed that almost all workers want to do a good job and want to be seen by their managers and peers to be successful. He believed that where it seemed that workers did not want this, that is workers were disengaged, the problem lay with the company management trying to make the workers work in an environment where they could not experience success. He identified the following factors which he believed were the causes of disengagement.

Employee engagement – engines of disharmony

Engines of disharmony

- What is my contribution
- What is my peer's contribution
- The gap between authority and responsibility
- Inherent conflicts
- Inertia

Need to remove these since it prevents engagement.

Insights from Dr Eliyahu Goldratt

The causes of disharmony

What is my contribution?

Many employees do not fully understand the purpose of their job and how it enables the organisation to reach its goals. Thus they are unable to see what they can do differently to improve their contribution to the overall organisation. And finally, they do want their contribution to be visible and recognised by superiors and colleagues, and if it is not they will become negative and despondent. Ignorance also leads to supervisors and managers focussing on what TOC calls local optima measurements. These measurements drive managers and workers to save costs (and lose production) on activities that are crucial to the overall organisation but make them look good on the quarterly numbers. Think of an old manufacturing plant where engineering starts cutting expenditure on maintenance in order to meet their budget numbers.

What is my peer's contribution?

If I do not understand what the company strategy requires from my peers in other departments I will focus on the fact that they make my life difficult at times and will only grudgingly cooperate. Once I am at this stage, volunteering information to make their lives easier will not happen often.

Conflicts

Many inherent and recurring conflicts exist in companies. An example would be where sales asks production to break into orders to meet commitments to customers while finance puts pressure on them not to do it due to scrap cost considerations. Having enough stock not to run out versus conserving cash is another. For the company to function employees need to compromise, but feel bad about it because it goes against what they believe is right for the company. This ruins their motivation.

Because these conflicts are inherent to the way the process runs, they are continuous, they tend to escalate and eventually undermine relationships between departments. TOC focusses on improving flow and as a result breaks these conflicts permanently. (The TOC Operations and Supply Chain solution)

In mining and manufacturing the problems of interdependency and variation causes similar issues. Because of interdependency the numbers do not tell us what is really going on. Managers and workers find that immediate pain can be avoided by being economical with the truth. Trust disappears and managers ask for more numbers, which still don't show them what is going on. The end result is low motivation and poor performance.

Inertia

Most companies have policies in place which were designed for the problems of the past, and which no longer exist. Employees often know intuitively that these policies are problematic but battle to prove it to their superiors. Having to do something you know is counterproductive to the interests of the company you hold dear is highly demotivating.

Gaps between responsibility and authority

When one asks managers whether they are responsible for certain outcomes without having the authority for some of the actions that are needed for these, they will agree with the statement. When one asks them whether the same is true for those reporting to them the answer is always no. And yet, their employees are pestering them to make decisions all the time. This draws managers into firefighting and their attention reduces on the high value tasks they were supposed to be focussing on. Again, this is demotivating for competent workers and stops them from developing their abilities and gaining mastery.

The engines of disharmony prevent workers from gaining mastery of their jobs and feeling that they have purpose. To determine employee engagement the Gallup Q12 questionnaire is widely used. It asks employees questions such as “I have the tools I need to do my job,” “I know what is expected of me” etc. In the presence of the engines of disharmony employees are unable to answer the majority of the Gallup Q12 questions in the affirmative. A low engagement and high disengagement score result.

Summary of this section

“Leadership is a process which creates an environment in which people want to perform. It excites employees and inspires them to focus on the interests of the group and the organisation.”

We identified that which is in the best interest of the mining organisation is to manage according to the recommendations from the complicated (and complex) domains. In practice, many factors conspire to make us manage as if we are in the simple domain. The most important of these are that we do not understand interdependency and variability very well and thus force efficiency measurements on the parts while ignoring the whole.

By trying to control activities vertically and by remote control, we disempower those that best know what needs to happen. In order to maintain vertical control and coordination senior and top management have to force certainty onto things that are inherently uncertain. Employee engagement decreases.

Leadership cannot be effective under these circumstances. We have misidentified what it is that is in the interest of the organisation and by disempowering workers from making a difference we have not inspired or excited them or created an environment in which they want to perform.

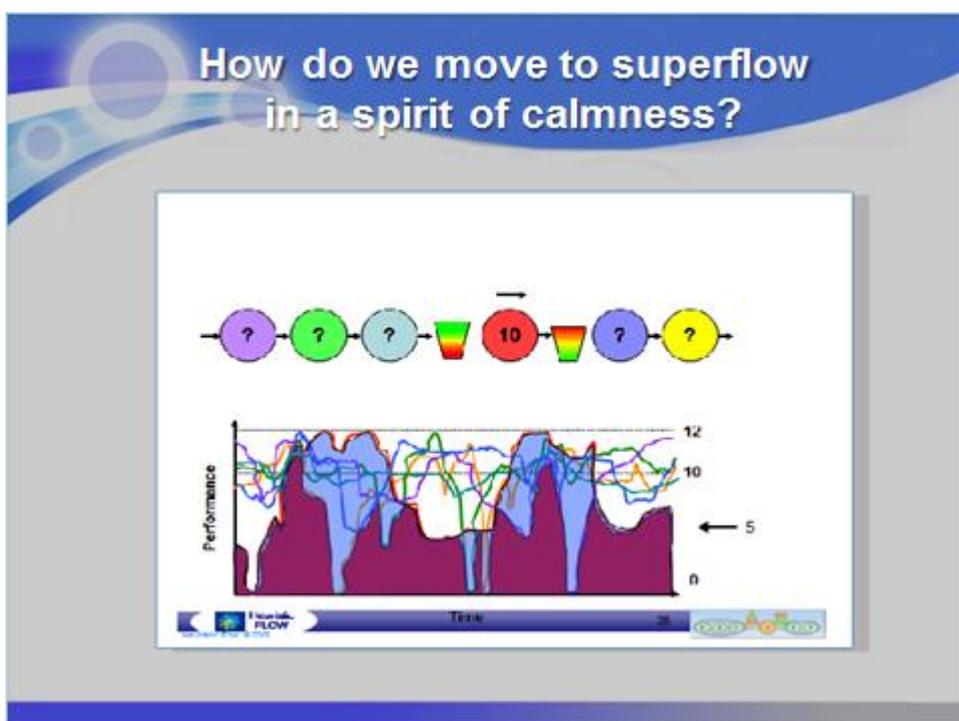
Pulling A Rabbit From A Hat - The Productivity Platform Intervention

We have now identified that the interest of the mining organisation is to manage according to systems principles (complicated domain) and that we have to ensure that we remove the engines of disharmony from the work environment.

How do we start managing according to systems thinking principles?

Change The Way We Structure Our Operations

By putting in buffers we decouple the bottleneck from the rest of the system. We can now focus our attention on running the bottleneck as well as possible. We do not need to spend a lot of time on the other parts since we size them with about 30% more capacity than the bottleneck. In that way we can catch up on production before Murphy strikes again.



In practice, we find that the cost of increasing the capacity of non-bottleneck departments to around 13 units per time interval is far outweighed by the value of the increased volume. This means that the non-bottleneck departments will be idle from time to time and also that their efficiencies will be lower than that of the bottleneck. This is fine.

How do we remove the engines of disharmony from the work environment?

We Need To Change How We Manage Our Personnel

Can we learn anything about productivity from companies such as Amazon, Google and Facebook?

They have developed ways of working which are in tune with 21st century procedures and processes. In our modern democratic society management is more inclusive than the traditional top down industrial Management Model. They have utilized a synergistic employee interaction between staff and management to facilitate an effective workflow process. The beauty of this is that both management and employees buy into the process as they have jointly created it. With buy in from employees across the board, you will have a situation where the company is not just a place of employment, but a place where an individual feels appreciated and respected. But to do this management needs to put in place processes and mental models that enable workers to become productive.

The Productivity Platform intervention - combining the new way of managing personnel with the new structure

The Productivity Platform intervention has now been used in TOC interventions in mining for the last 15 years. It was developed by Arrie van Niekerk of Tavanec.

The Flow Room is truly the silver bullet that liberates human potential and generates substantial business improvement.

The Direction Of Change When Implementing Scrum Production Flow

It is much more about the management approach than the technical detail

It is much more about Flow and Buffer management than costs and local efficiencies

It is much more about managing the interdependencies than controlling the individual silos (organisation elements)

It is much more about managing the means than managing the numbers

It is much more about focus (looking at a small number of matters) than looking at everything in detail

It is much more about enablement than pulling back on the reins

It is much more about leadership according to principle and purpose than mechanistic management rules and regulation

What it is and what it does

The Productivity Platform intervention does not remove the need for hierarchy. Without hierarchy we will eventually create anarchy. For 30 minutes each day it creates a change platform where the negative effects of hierarchical control are reduced and effective horizontal coordination becomes possible.

The Productivity Platform meeting, (or the Flow Room) is the place where the heads of departments, middle managers and selected employees get up-to-date visual information on what is happening to the business as a whole. Colour codes identify where attention should be focussed and where help from support functions such as HR and maintenance is required. In the Flow Room HR becomes aware of what the business really needs and becomes empowered to deliver. The Flow Room provides a forward view and highlights patterns of interaction needing more attention. It moves the company out of firefighting by highlighting problems before they occur and putting in shock absorbers (buffers) to handle variation and interdependence. We manage the system holistically by

asking departments to support the overall flow through the company. Setting up a Flow Room means that teamwork will occur across layers and functions.

Studies in software development have found that the speed of work in individual programmers varies by a factor of 10 from best to worst. In teams, the variation between the slowest and fastest differs by a factor of 2000. Getting teams to work together is much more important than trying to obtain the most skilled workers in every position. This is the reason we are sceptical of some of the claims that miners are finding it difficult to recruit good staff. The ability to get the team to work together towards the same goal is where Scrum delivers the most value.

Intervention: Standup Scrum Production Flow meeting

- It is a change platform.
- It coordinates activities across functional departments.
- All departments see how their actions affect the flow of the overall system.



- From the pattern of red, yellow and green on the flowchart problem areas are identified in advance (focus).
- Employees engage in dialogue and support one another.
- Teamwork occurs.
- Restrictive policies are abolished on the spot. Responsibility/authority conflicts are dealt with.

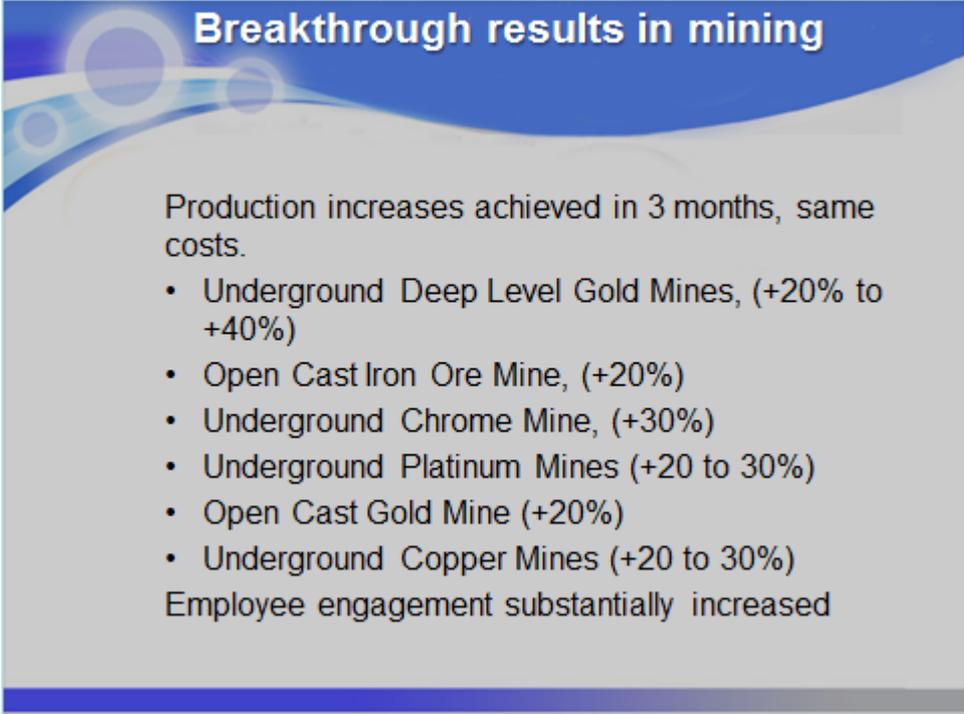
Visual representation of reality

North Pit

Date	Waste						Ore			Delivered to Stockpiles				
	Released Waste Blocks	Prepared Drill Blocks	Baked Drill Blocks	Drilling Tonnes	Drilled Tonnes	Washed Waste Tonnes	Load & Haul Tonnes	Washed Ore Tonnes	Load & Haul Ore Tonnes	40-45 Fe Stockpile Tonnes	45-50 Fe Stockpile Tonnes	50-55 Fe Stockpile Tonnes	>55 Fe Stockpile Tonnes	Sweet Ore Stockpile Tonnes
Frequency	Available	Available	Available	Per Dr Day	Available	Available	Per Day	Available	Per Dr Day	On-Stockpile	On-Stockpile	On-Stockpile	On-Stockpile	On-Stockpile
Target	5 Days 350 000	5 Days 3 500 000	5 Days 350 000	70 000	5 Days 55 000 000	10 Days 700 000	70 000			1 000 000	74 000	24 000		
Threshold	2 Days 140 000	2 Days 1 400 000	3 Days 21 000	51 300	2 Days 14 000 000	3 Days 350 000	51 300			550 000	40 000	13 500		
29-Aug	637 331	1 794 425	253 376	77 020	38 024	322 756	66 660			503 253	176 735	20 725	26 080	1 680
30-Aug	637 331	1 794 425	243 564	62 206	1 043 055	263 626	40 140			503 253	176 735	20 725	26 080	1 680
31-Aug	637 331	1 794 425	213 304	17 280	1 060 335	251 065	12 560			503 253	176 735	20 725	26 080	1 680
01-Sep	637 331	1 794 425	80 770	47 534	1 107 869	228 106	22 980			503 253	176 735	20 725	26 080	1 680
02-Sep	637 331	1 794 425	276 630	84 240	1 192 009	161 455	46 690			503 253	176 735	20 725	26 080	1 680
03-Sep	637 331	1 794 425	213 308	62 122	1 225 131	140 605	40 765			503 253	176 735	20 725	26 080	1 680
04-Sep	637 331	1 794 425	239 591	13 613	82 2240	330 681	36 290			503 253	176 735	20 725	26 080	1 680
05-Sep	637 331	1 794 425	244 533	35 336	1 013 762	528 086	42 210			503 253	176 735	20 725	26 080	1 680
06-Sep	637 331	1 794 425	89 370	48 189	1 050 351	325 086	62 645			503 253	176 735	20 725	26 080	1 680
07-Sep	637 331	1 794 425	74 368	24 905	1 083 735	295 476	34 560			503 253	176 735	20 725	26 080	1 680

The outcome from managing our mine the new way

In more than 70 implementations of what we call Productivity Platform we have seen production increases of between 7–50% and cost reductions of 10–30% per ton. The intervention typically delivers within 5 months and production increases in the following ranges:



Breakthrough results in mining

Production increases achieved in 3 months, same costs.

- Underground Deep Level Gold Mines, (+20% to +40%)
- Open Cast Iron Ore Mine, (+20%)
- Underground Chrome Mine, (+30%)
- Underground Platinum Mines (+20 to 30%)
- Open Cast Gold Mine (+20%)
- Underground Copper Mines (+20 to 30%)

Employee engagement substantially increased

When visiting a site a few months after the implementation of a Productivity Platform, in observing meetings, it is impossible not to notice the change in the demeanour of employees and managers alike. Employees are confident, excited about what they are doing and walking tall. The biggest visible change is in the behaviour of those that were considered cynical and non-team players before. Since they were the ones who saw the problems inherent in the old system and spoke out about them they were pushed aside. These employees are often the stars in the new environment. Employees speak in glowing terms about the improvement in Leadership abilities of their managers. The MD's body language is also very different, where the mining team was on the periphery before they are now intimately involved in strategies and planned interventions. Before launching new interventions, top management now consults the mine manager. There is no need to measure employee engagement, it is clear that employees are highly engaged.

The story of a Mine in Lesotho

The following story, one of many, again illustrates the misconception we as managers have of our workers, their abilities and willingness to deliver results.

In 2014, a TOC implementation on a mine in Lesotho led to a transformation in production and employee engagement. To make the interdependency and variability in the system visible we captured the production flow on large sheets of paper. The managers and workers from all functional

departments received 2 weeks of training around the principles of operating the Flow Room. Then we had to stop our support for about 3 months due to the unstable political climate, amongst other things.

In much of this period of instability, the better-qualified South African personnel were unable to enter Lesotho. On re-entry, a miracle seemed to have taken place. The red had disappeared off the board, replaced by green. Having been described as “not of a high standard and not accountable” three months earlier, the Lesotho workers at this site rose to the challenge and exceeded all expectations. Production and profits were substantially higher, such that head office decided to extend the life of the mine for another few decades.

How did this happen? The dialogue created in the Flow Room is very familiar to people from an African culture. They were able to see their impact on the production system, the impact of their colleagues, where the bottlenecks were developing, and were able to support one another in preventing this and keep each other accountable. As their confidence grew so did enjoyment of their work and the effort each person was willing to put in. For many of the employees this was their first experience of being successful and operating in a winning culture.

Conclusion

The Productivity Platform intervention delivers results by enabling mine managers to lead in a way that is appropriate for the environment they operate in. It enables them to manage the production process according to systems thinking principles and their employees according to modern information age management methods. It creates a change platform for managing interdependency and variability, which is much more effective than change programs driven by consultants. By making the production flow visible it is safe to move decisions closer to where the work is being done and effective horizontal coordination of work becomes possible. This enables employees to apply intrinsic motivation, a necessary condition for engagement.

By virtue of not having to force certainty on uncertain processes (the buffers absorb variation) managers find that they have much more time and can start to plan for the future. Managers can now identify the critical few issues which are in the interest of the organisation and create the environment where employees become intrinsically motivated to do what is in the interest of the organisation.

In this way we create an effective Leadership platform. Good Leadership trumps any intervention known to man.

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