



Remote Sensing Service in Leaching Process

The Right Information



On the Right Time



On The Right Place



Backing your
competitiveness





Remote Sensing Service

- ✓ We Identify a key issues that really matter and then we integrate the better cost-effective solutions that add value sustainably in several sceneries of copper market, in order to backing the customer competitiveness.
- ✓ Our core value is to deliver riched information with added value for your leaching processes through their entire life cycle and supporting the decision makers, providing them the right Information on the right time and the right site.
- ✓ In order to rectify your process indicator and consequently , either to reach or improve your outcome metrics and at same time avoiding fall into the trap of measure results after the event, that is, measuring things that they cannot influence or to late to make countermeasures.





Remote Sensing Service

Approach : Casting our Value Stream Process from the Customer Perspective

Demand

Find the potential customers and help them become aware that we might be valuable to them.

Qualifying

Understand the customer's business well enough to help their decision makers understand the business problems we could solve for them.

Proposing

Understand the customer's application requirements well enough to credibly demonstrate our solution is best for their needs.

Delivering

Help the customer achieve the business results they expect through our services.



Focusing On Heap Leaching Operation.

The metallurgical heart of the majority of copper oxide processes

"In a continuous processes, your process are as strong as your weakest link, and as fast as your slowest process"

Eliyahu M. Goldrat, Theory Constraints

"If you can not measure it, you can not improve it"

Lord Kelvin, Kaizen Strategic

"Improving one process will do nothing for the throughput of the system if the entire system is not considered."

Lean Philosophy



Business Cases Aliened with the Business Charter Responding to Up/downstream customer demand



BHP BILLITON CHARTER

WE ARE BHP BILLITON, A LEADING GLOBAL RESOURCES COMPANY.
Our purpose is to create long-term value through the discovery, development and conversion of natural resources, and the provision of innovative customer and market-focused solutions.

To prosper and achieve real growth, we must:

- actively manage and build our portfolio of high quality assets and services,
- continue the drive towards a high performance organisation in which every individual accepts responsibility and is rewarded for results,
- earn the trust of employees, customers, suppliers, communities and shareholders by being forthright in our communications and consistently delivering on commitments.

We value:

- Safety and the Environment** – An overriding commitment to health, safety, environmental responsibility and sustainable development.
- Integrity** – Including doing what we say we will do.
- High Performance** – The excitement and fulfilment of achieving superior business results and stretching our capabilities.
- Win-Win Relationships** – Having relationships which focus on the creation of value for all parties.
- The Courage to Lead Change** – Accepting the responsibility to inspire and deliver positive change.
- Respect for Each Other** – The embracing of diversity, enriched by openness, sharing, trust, teamwork and involvement.

We are successful in creating value when:

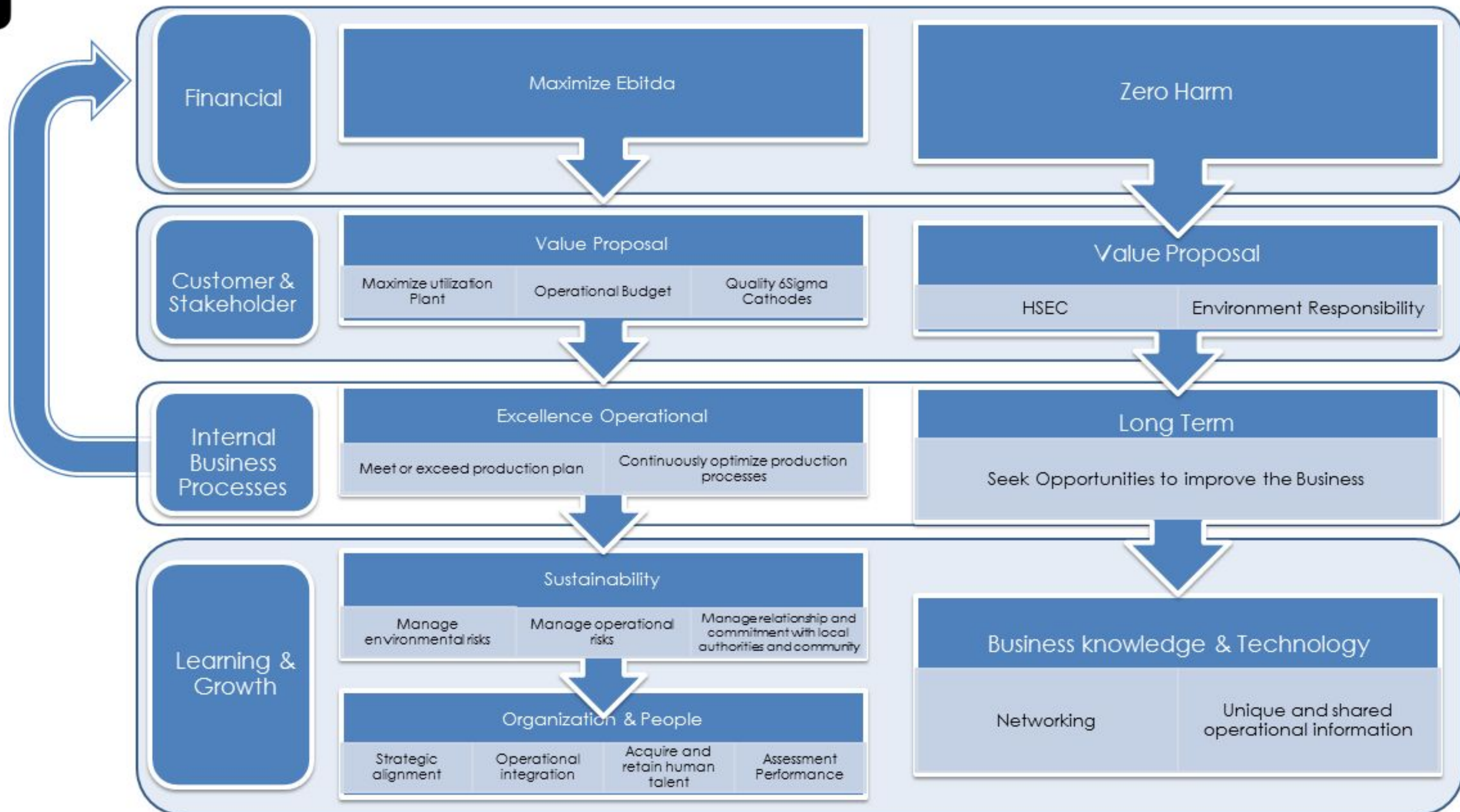
- our shareholders are realising a superior return on their investment,
- the communities in which we operate value our citizenship,
- every employee starts each day with a sense of purpose and ends each day with a sense of accomplishment.

Marius Kloppers
Marius Kloppers
Chief Executive Officer
October 2007

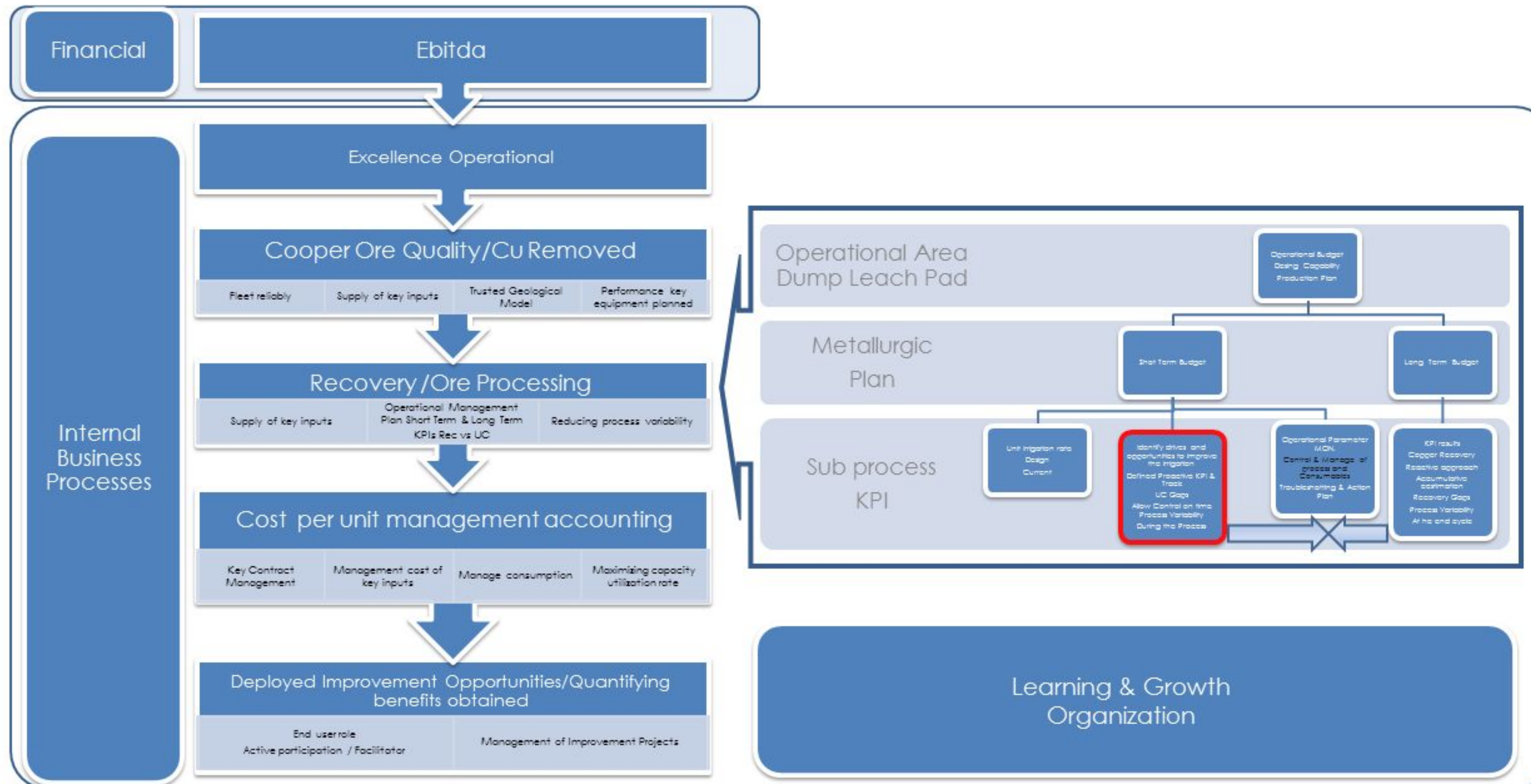
bhpbilliton
resourcing the future

Be competitive in fluctuating scenarios of cycle copper Market

Business Cases Aliened with Perspectives of BSC and Sustainable Value Added

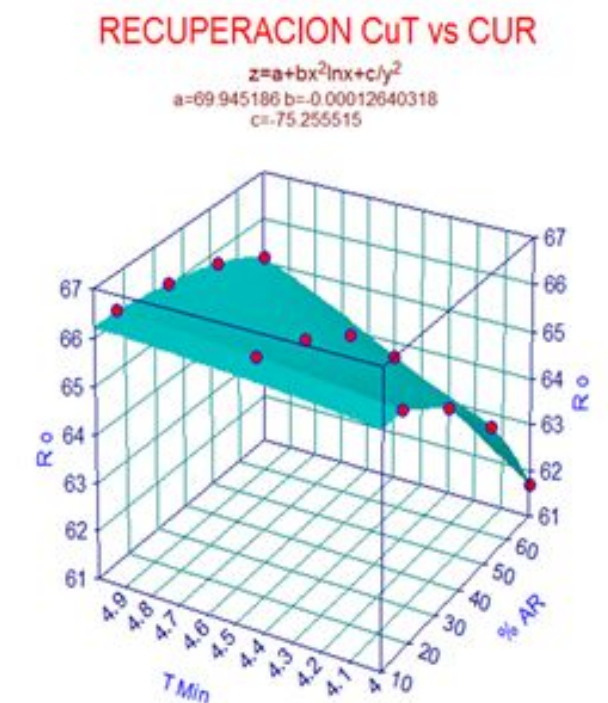
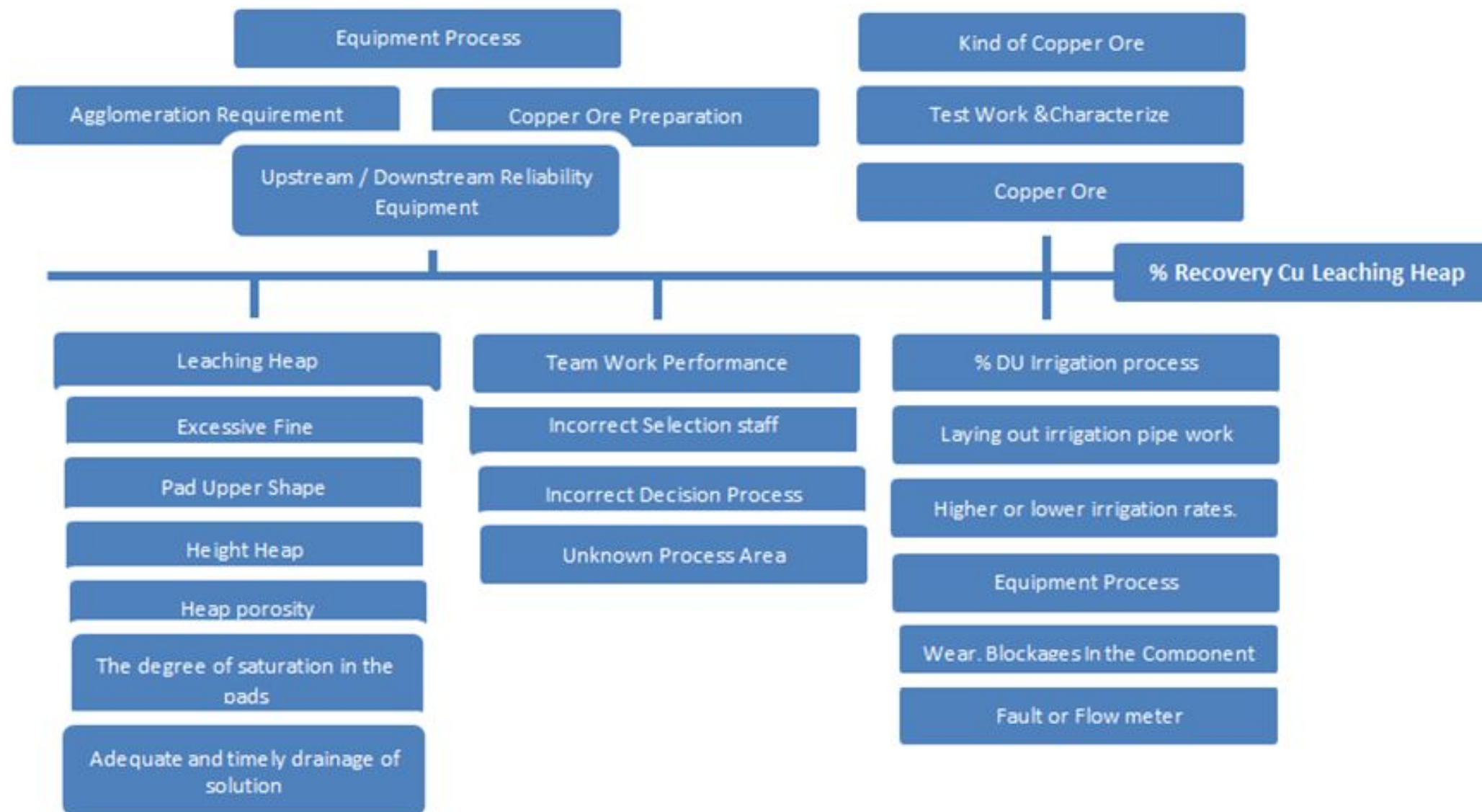


Business Cases Aliened with BSC and Sustainable Value Added



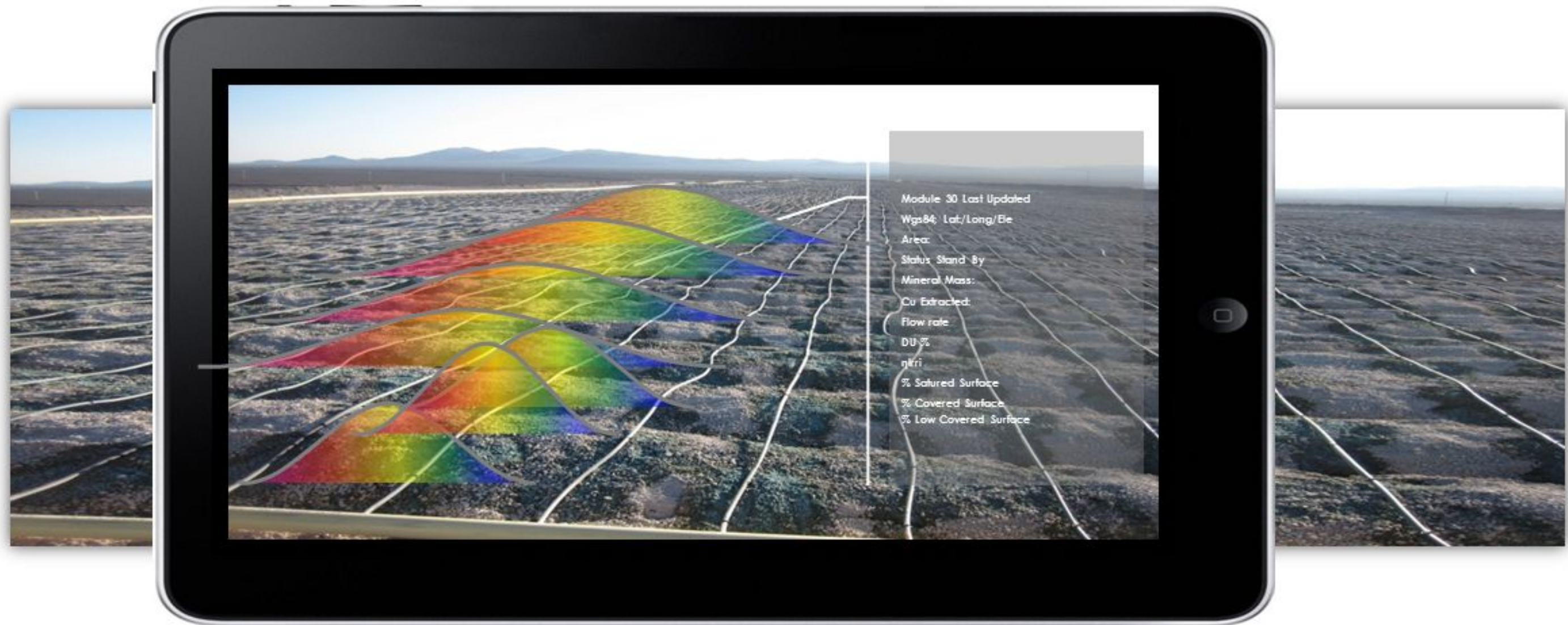
Relentless continuous improvement Ishikawa Diagram Leach Pad / Recovery Cu

The success of this unit operation "is so important that operators need to understand the ramifications of their decisions or non-decisions and how they could affect the Up/Downstream processing.





What The Decision Makers Need On site?
The Right information On the Right Time and On The Right Place.





The True North for us is backing your competitiveness through adding value to your internal processes bearing in mind the Sustainable Outcomes





Cost effective RSS Available on Market

IDN Service offer an Unique Value Proposition which is previously unavailable, unfeasible and unworkable solution on the mining market



Project Portfolio Assessments Business Cases/ PICK Chart



Possible (Lower Left Quadrant) - Easy to execute, but with a low payoff, which in business language means take it if nothing better comes along.

Implement (Upper Left Quadrant) - Easy to execute with a high payoff.

Challenge (Upper Right Quadrant) - Difficult or (challenging) to execute but with a high rewards payoff. These projects are for individuals who get their job satisfaction from seeing their "hard work payoff."

Kill (Lower Right Quadrant) - Hard to execute with a low payoff. The only question left on this one is where is the trash can?

Project Charter Aliened with the Mining Core Business

| Project Charter / Business Case | | | | |
|---------------------------------|---|-----------------|------|-----------|
| Project name | Remote Sensing Service on the Leaching Heap in the Copper Mining | | | |
| Authorizations | Name | Function | Date | Signature |
| Author | Rodolfo Stocker | Project manager | | |
| Approved | By Customer Responsible | Project Sponsor | | |
| Project Context & Background | <p>The essential values from the customer statements are focusing on achieve real growth by high performance, of achieving superior business result and stretching their capabilities.</p> <p>The customer operation's continuously is seeking ways to add value to their business unit and increase their Ebitda, commonly through finding opportunities to improving the business performance and the most of time the client approach is in their internal process by achieving operational excellence, reaching their desing capability and making the best use of the resources.</p> <p>To help to increase the profitability on the entire cycltime process.</p> <p>To increase the steady production with less consumables.</p> <p>To improve overall plant economics through enhance the copper recovery.</p> <p>To reduce the module, heap, irrigation, area and downstream plant cycle times.</p> | | | |

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| | | |
|-------------------------------------|--|-----------------------|
| Success Criteria | recovery of copper which is a function of a variable irrigation rate, for this reason is necessary make frequently irrigation audits because this is a key factor of the process control in leaching acid in piles | |
| Methodology/ Approach | The current forecast method is the recovery copper index which is represented by the characteristics curve of copper recovery with a graphical representation of the accumulative yield on the leaching copper process at the end of their life cycle and therefore it is a reactive KPI, that shows the outcome process performance as the end of cycle leaching process. | |
| | To reach target figures of Copper Recovery planned, on the leaching process, depend on to control several variables during the process and among these one with higher relative weight, which is the irrigation rates and the coverage area on the heap. | |
| | The uniformity coefficient (UC) is a key performance indicator process that allow to make desition based on the information map, which come from the Remote Sensing Service through the module life cycle process, in order to: | |
| | - Ensure the recovery copper leaching heap - Decrease the irrigation process variability - To cope the bed permeability avoiding the saturation heap or module | |
| | Remote Sensing is a service of obtaining relative information about the leaching heap (physical objects), through the process of recording, measuring and interpreting imagery and digital representations of aredo irradiation patterns derived from noncontact sensor systems". | |
| Project Resources | | |
| Project Meeting Group | Area Responsible | |
| Sponsor | Designate from the Customer | |
| Project Manager | Rodolfo Stocker | |
| Project Team Members | if it require | |
| Other | | |
| High Level Estimate of Project Cost | USD240.000 yearly | |
| Man/days | 4 week per Months | |
| Cost | USD 30.000 Monthly | |
| Issues & Risks | The prospect customer reaches the production target by themselves, with their current resources, remain unbelivers, be satisfied and committed with their current methodology. | |
| Assumptions | The prospect customer no reaches the production target by themselves, with their current resources, be dischided and uncommited with their current methodology. | |
| Constraints & Dependencies | Area Responsible/Sponsor/ Project Manager | |
| Reporting | Frequency | Who |
| Meeting | | |
| Steering Committee Meeting | Monthly | Steering Co. +PMA |
| Project Team Meeting | Monthly | Project Team+PMA |
| Report | | |
| Progress Report | Monthly | Sponsor, Steering Co. |
| Closure Report | Monthly | Sponsor, Steering Co. |



Remote Sensing Service

- ✓ Value Stream Process conceived from the customer perspective.
- ✓ Value chain organized to be continuous, focused on add value and sustainable outcomes.
- ✓ The best cost effective RSS available on market





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