



VBKOM

Capability Statement

Industrial Engineering

The VBKOM Industrial Engineering division is driven by its goal to optimise complex processes and systems.

It focusses on improving and integrating people, processes, technology, and infrastructure on capital-intensive projects as well as mining and other operations.

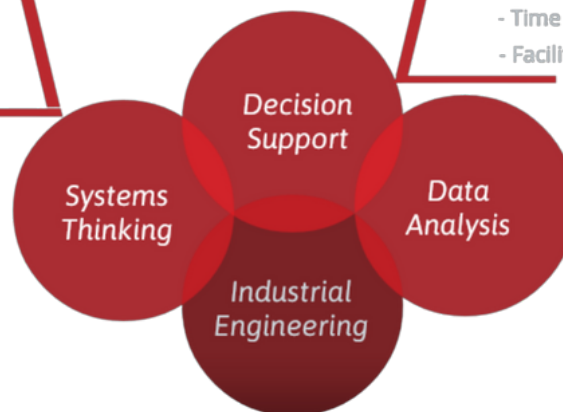
VBKOM's competitive advantage lies in its integrated approach with multi-skilled resources that are well versed in the requirements of the full mining and capital intensive value chain and project requirements. VBKOM has successfully provided solutions to a range of clients in the mining industry since 2008 when VBKOM was founded in Centurion, South Africa. Please refer to our website for more detail on other disciplines at www.vbkom.com.

Our Approach

Our Industrial Engineering offering can be summarised as follows:

- Stakeholder Engagement
- Requirement Definition
- Operational Readiness Planning
- Value Engineering

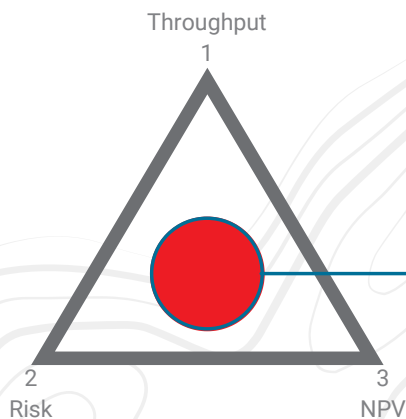
- Simulation
- Financial Modelling
- Options Analysis
- Time studies
- Facilitation



- Data Mining
- Bespoke Data Management Apps
- Business Intelligence

Decision Support

At VBKOM we believe all decisions must be based on the next 3 criteria and we have the necessary toolkits available that can be tailored to evaluate these criteria depending on the project complexity and time available for making the decision.



VBKOM Industrial Engineering Toolkits:

- › Throughput, risk and NPV definition toolkits
- › Capital Intensive Project Framework Understanding
- › Strong Documentation Skills

Our toolkits include:

- › Simulation
 - SIMIO Process simulation software and skills
 - @Risk Monte Carlo simulation software and skills
- › Standard industrial engineering process evaluation, mapping and constraint definition skills
- › Financial Modelling
 - Discounted cashflow modelling, analysis, measurement and reporting toolkit and skills
- › Risk Assessment
 - Qualitative risk assessment facilitation and reporting toolkits and skills
 - Quantitative risk assessment (QRA) software, facilitation and reporting toolkits, and skills
- › Time Studies
 - Vehicle GPS tracking and route and cycle time recording equipment and mapping software
 - Time study recording, analysis and reporting process, toolkits and skills



Financial Modelling

Financial modelling is a process which considers the economic worth of any endeavor. Our industrial engineers, techno-economic specialists and mining engineers provide key experiential input and skill to support you with the following financial modelling services:



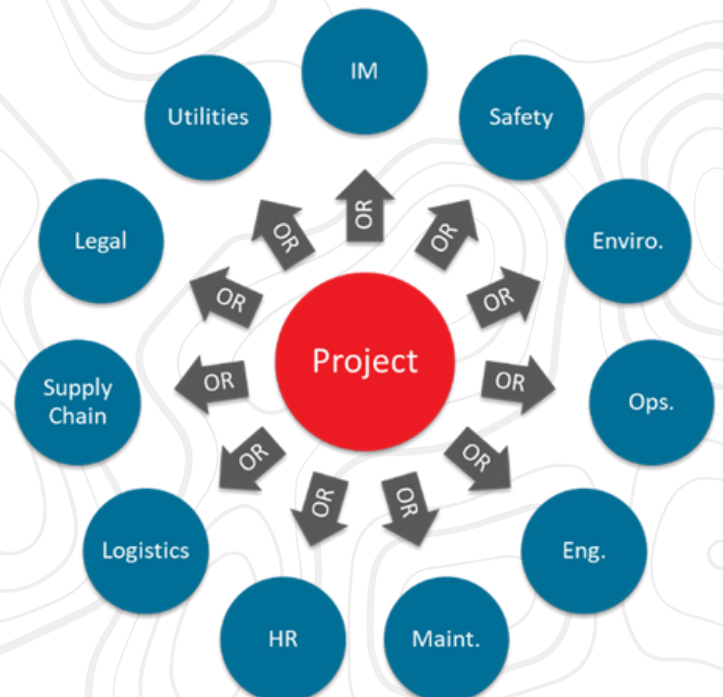
- › Asset Allocation and Investment Strategy
- › Business Valuation and Technical Audits
- › Capital Contingency Determination
- › Forecasting and Cost Estimation
- › Metric Reporting — NPV, IRR, EBITDA, Pay-Back Period
- › Operational Trade-off Analysis
- › Stochastic Modelling and Probabilistic Range Analysis
- › Sensitivity Analysis
- › Regulatory Project Phase and Confidence Level Compliance

Systems Thinking

All projects have multiple stakeholders as illustrated in the following figure. We find that in capital intensive projects the engineering stakeholders and deliverables are however prioritised and the other stakeholders that may introduce fatal flaws in the project are neglected.

We believe that Operational Readiness (OR) is a key discipline that must be employed to ensure that:

- › All stakeholders requirements are understood
- › Engineering designs are evaluated to be fit-for-purpose when measured against these requirements
- › The actions required to address all system inputs, outputs, mechanisms and controls then need to be defined in an OR project execution plan that takes into consideration all change management activities to ensure stakeholder buy-in and adoption of the deliverables



Planning OR properly ensures:

- › Smooth project handover to operations
- › Fit-for-purpose solutions that integrates well with interfacing systems
- › An operational team that is prepared to operate and maintain the new system or facility

Our team is fully equipped to address OR due to:

- › Standard industrial engineering system definition and process evaluation, mapping and constraint definition skills
- › Project management trained individuals to ensure project governance artefact development and adherence
- › Operational readiness checklists, templates and skills to define requirements and plan for execution
- › Hazard and Operability (HAZOP) accredited facilitation skills to not only understand the hazards but the operability problems when considering the OR requirements

Operational Readiness

This is a discipline that represents the project owner's interests and ensures that the project stakeholders are engaged at an early stage to make sure that a fit-for-purpose solution is put on the table and that the end-user requirements are built into the design from the start. Operational readiness deals with the so-called “soft” issues and plans for aspects such as:

- › The operating philosophy
- › Ensuring that the business requirement is translated into an appropriate functional requirement that will meet operational needs
- › Design integration to ensure correct application of functional requirement
- › Handover / ramp-up activities
- › Setting up an opex / manpower budget
- › Update operational / maintenance manuals and systems
- › Setting up the necessary service contracts
- › Facilities / processes interfaces



Simulation Services

VBKOM follows a standardised approach with all of its simulations and tailors the detail and intensity according to the customers'/project specific requirements.

Should the simulation engagement roll over into implementation, we are well equipped with other competencies to assist clients by managing the project implementation and measuring performance against the study projected results.

Our Simulation services include:

- › Financial decision support
- › NPV/ business case modeling
- › Expected value analysis and simulation
- › Capital estimation and sensitivity determination
- › Multiple scenario modelling
- › Discrete event and process simulation (SIMIO) with integrated three-dimensional visualisation
- › Monte Carlo simulations
- › Probabilistic branching / schedule option simulation
- › Option analysis support
- › Decision tree / option analysis
- › Scenario development facilitation

Project Types

Our team has a vast range of experience across all types of projects in South Africa and Africa. Typical industrial engineering projects completed include:

- › New mine development studies
- › Existing mine optimisation or expansion studies
- › Equipment and fleet trade-off studies
- › Due diligence evaluations
- › Operational support
- › Business improvement support
- › Mine works programmes
- › FIDIC/NEC contractual employer requirements
- › Mining right applications

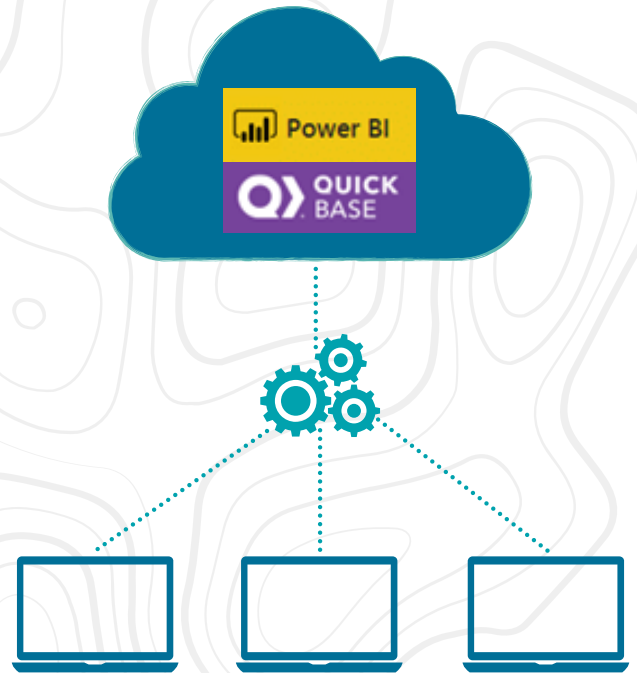


Data Analysis

As industrial engineers, it is part of our standard skillset to map out processes and understand the required measures and how to effectively gather data at the right process points in order to enable efficient reporting. We also align our reporting to the systems the client already has and do not enforce new processes and systems unless really necessary.

We typically help clients to:

- › Define the process and business rules to be followed
- › Understand where the data sources are
- › Build low cost cloud based systems with customised workflow to gather data required for reporting not captured in their current systems
- › Consolidate the data to a single reporting platform
- › Build prototype reports at a low cost in order for the client to discover what they really want to see
- › Build automated real-time dashboards in Power BI that is already available at most clients as part of their Microsoft licensing
- › Build ad hoc Excel based add-ins to automate complex calculations operators needs to perform on a daily basis
- › Start with basics and grow into a more sophisticated solution when the client organisation is ready



Our data analysis toolkit includes:

- › Detailed understanding of mining and capital intensive project performance drivers and criteria
- › Standard industrial engineering data mining and analysis skills
- › Power BI reporting software and skills
- › Cloud based data management and reporting skills within the Quickbase system

Our Value Proposition

VBKOM is a provider of innovative business and technical consulting services and solutions for the mining and capital-intensive industries throughout Africa. We challenge ourselves to apply fresh thinking and to utilise our experience and technology in pioneering new ways to deliver forward-thinking solutions.

Due to VBKOM's diverse pool of expertise, we can offer our clients specialised skills within a one-stop-shop culture. Our engineering, risk, and project management capabilities as well as simulation and decision support expertise, make us an ideal partner to the mining, petrochemical, agricultural, and construction industries.

Our focus on long-term client relationships combined with our technical skills ensures that our clients can fully optimise their value chain.

At VBKOM the quality of our work is guided by a simple philosophy – our success is driven only by the success of our clients and the achievement of our professionals. By using cutting-edge technology and the most advanced computer modelling systems on the market our technical expertise comes unrivalled. Our capacity and continuity have earned us the trust of some of the world's most prestigious mineral resource companies. By staying true to our core values; by utilizing our vast project-specific experience and qualifications; along with applying proven world-class methodologies and processes the VBKOM team is a dynamic, flexible and innovative team with a track record standing as solid proof of our competitive edge in our field.

VBKOM employees have been successful in providing solutions of an independent nature to a range of clients in the mining industry. Our consultants have developed a good understanding of the needs and opportunities of both open pit and underground studies and operations and we look forward to adding value to your company. We believe that independent consultants can provide optimal solutions to the Client without any risk of providing a solution with an inherent conflict of interest. The VBKOM strategy is to form part of the owner's team to define and protect the owner's interest within our area of influence and control. VBKOM is committed to adding value to each client through innovative, practical, and trustworthy engineering solutions.

