Understanding the Mining Business Model

Cuan Kloppers, Group Manager: Group Business Systems, Samancor Chrome
“In ancient times, those known as good warriors prevailed when it was not easy to prevail. Their victories were not flukes because they positioned themselves where they would surely win ...”

Sun Tzy - The Art of War
Roadmap

• Positioning Mining with Strategy, People, Processes & Technology
• The ability to change
• Macro Processes in the Mining Business
  • Components
  • Business drivers
  • Business challenges
  • Critical success factors
  • Reporting requirements and systems
• Technology as a business process enabler – the big picture
• The Integrated Solution
• Utilising ERP to enable a business
• Business Intelligence as a strategic tool
Understanding your company's environment

Environment
- Economic
- Regulatory
- Physical
- Social
- Technological

Strategy
- Corporate Strategy / Vision
- Operating Strategy
- Organisation Strategy

Operating Model
- Process
- Technology
- Physical Setting

Organisation Framework
- Organisation Structure
- Individual
- Learning/Training/
  Knowledge Transfer
- Required Capabilities
- Resourcing
- Performance Management
- Communication
- Culture
- Performance Support

is key to position yourself in the market today!

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## Typical Challenges and Business Drivers

### Industry Challenges
- Multiple Locations
- Changing Market Dynamics
- Communication Infrastructure
- Complex Legislative Environment
- Organisational Size
- Complex Stakeholder Environment
- Transformation
- Cost Containment

### Business Drivers
- Supply & Demand Planning
- Performance Driven Organisation
- Cash Flow Management
- Asset Management
- Operational Efficiency

in the Environment of a typical Mining Company today
<table>
<thead>
<tr>
<th>Rank</th>
<th>Top 10 Business Priorities</th>
<th>Top 10 Technology Priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Business process improvement</td>
<td>Business intelligence</td>
</tr>
<tr>
<td>2</td>
<td>Reducing enterprise costs</td>
<td>Enterprise applications (ERP, CRM and others)</td>
</tr>
<tr>
<td>3</td>
<td>Improving enterprise workforce effectiveness</td>
<td>Servers and storage technologies</td>
</tr>
<tr>
<td>4</td>
<td>Attracting and retaining new customers</td>
<td>Legacy application modernization</td>
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<tr>
<td>5</td>
<td>Increasing the use of information/analytics</td>
<td>Collaboration technologies</td>
</tr>
<tr>
<td>6</td>
<td>Creating new products or services (innovation)</td>
<td>Networking, voice and data communications</td>
</tr>
<tr>
<td>7</td>
<td>Targeting customers and markets more effectively</td>
<td>Technical infrastructure</td>
</tr>
<tr>
<td>8</td>
<td>Managing change initiatives</td>
<td>Security technologies</td>
</tr>
<tr>
<td>9</td>
<td>Expanding current customer relationships</td>
<td>Service-oriented applications and architecture</td>
</tr>
<tr>
<td>10</td>
<td>Expanding into new markets or geographies</td>
<td>Document management</td>
</tr>
</tbody>
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Extracted from Gartner 2009 CIO Survey
Key Components of Business Solution Integration

People

Strategy

Process

Technology

to understand the Mining Business model
Typical Mining Business Model

External business drivers and stakeholders
Stakeholders, Customers, Regulators, Natural Forces, Image / Public Perception, Suppliers
Economy, Labour, Competitors, Technology, Political Environment

Commodity Segmentation:
- Precious metals
- Base metals
- Specialty metals
- Iron ore
- Industrial minerals
- Coal
- Gemstones
- Uranium

By Operation Focus:
- Exploration
- Fully integrated
- Mine Services
- Single- or Multi-Commodity

Core Business Processes
- Acquire & Develop Reserves
- Extract Ore
- Process Ore
- Sell Product
- Mine Close

Support Processes
- Health and Safety
- Information Management
- Supply
- Environmental
- Maintenance
- Human Resources
- Treasury Management
- Asset Custody

Customers
- Joint Ventures
- Other mining companies
- Utilities
- Customers
- Contractors
- Engineers
- Royalty Owners
- Suppliers
- Trade Associations
- Governments
- Outsourced Suppliers

Minerals (including ore)
- Concentrates (including ore and slimes)
- Manufactured Products
- By-products (eg, sulphuric acid; industrial diamonds)
- Mine Services (Engineering [CRA, BHP], Technical Mining and Maintenance [eg, SA mining houses])
- Tolling / Custom Milling
- Excess capacity
- Refineries / Smelters
Processes in the Mining Business

need to be integrated and support the vision and strategy

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Processes in the Mining Business

Strategic Business Processes

Core Business Processes

Support Business Processes

need to be integrated and support the vision and strategy
The Objectives

Operational
1. Determine strategic objectives for the company by commodities, markets, countries and customers
2. Provide a clear strategic direction to the business
3. Identify, source and allocate resources necessary to execute strategy
4. Promote culture of continuous improvement

Reporting
1. Measure business performance against strategic objectives
2. Confirming the financial statements and supplementary disclosures
### Critical Success Factors

1. Proper understanding of mining sector
2. Proper understanding of company’s competitive strategy
3. Focused strategic plan
4. Successful implementation & monitoring of strategic plan
5. Adapt to changing environment

### Key Performance Indicators

1. Return on equity; Share price comparisons; Analyst rating comparisons
2. Actual vs. budget comparison
3. Return on assets
4. Actual vs budget comparison
5. Share price comparison
6. Shareholder / analyst perception
## Strategic Business Processes

### Measure

1. Average selling price per unit
2. Foreign exchange rate effectiveness
3. Payroll to sales
4. Sales price effectiveness
5. Market capitalisation per ounce
6. Purchasing effectiveness
7. Mining operations cost per ton mined
8. Total operating cost per ton milled
9. Total cash cost per ounces poured

### Calculation

1. Total sales / ton sold
2. Foreign exchange rate achieved / spot foreign exchange rate
3. Total salary and fringe expense / net sales
4. Average sales price achieved / average spot price
5. Market capitalisation / number of ounces available
6. Purchasing costs current year / purchasing costs prior year (comparison to local country inflation rates)
7. Mining operating cost / ton mined
8. Total operating cost / ton milled
9. Total cash cost / ounces poured
**Measure**

1. Production effectiveness  
2. Exploration expenditure ratio  
3. Hedging ratio  
4. Ore mining cost (Bank comparison - World Averages)  
5. Safety  
6. Product development cycle time  
7. Capital expenditure cycle time  
8. Crushing & Milling effectiveness  
9. Mining grade (grams per tonne)  
10. Mining strip ratio  
11. Milling grade (grams per tonne)  
12. Milling recovery (%)  

**Calculation**

1. Actual production / budget production  
2. Total exploration expenditure / total sales  
3. Future production hedged / future production  
4. Mining costs / number of units mined  
5. Number of lost time injuries  
6. Time from spending capital to start of capital project  
7. Throughput rate per hour  
8. Average daily ore milled / design throughput rate  
9. Unavailable machine time / total available machine time  
10. Industry standard
Processes in the Mining Business

Strategic Business Processes

Core Business Processes

- Acquire & Develop Reserves
- Extract Ore
- Process Ore
- Sell Product
- Mine Close

Support Business Processes

need to be integrated and support the vision and strategy
The Mining Value Chain...

Core Business Processes

Acquire & Develop Reserves → Extract Ore → Process Ore → Sell Product → Mine Close

Core business processes are the processes that develop, produce, sell, and distribute an entity’s products and services.

These processes do not follow traditional organisational or functional lines, but reflect the grouping of related business activities

...the heart of the business
Components of the Core Business Processes...

...is the lifeblood of the business
Typical Key performance indicators (KPI’s)

Core Business Processes

1. Acquire & Develop Reserves
2. Extract Ore
3. Process Ore
4. Sell Product
5. Mine Close

Targeting
- Number of failed mining developments

Acquisition
- Ratio of successful acquisitions / targets
- Number of titles lapsing unintentionally

Exploration & Evaluation
- Budget vs actual production statistics
- Time and cost to obtain permit
- Delays to project (days)
- Actual vs budget cost; days late commissioned
- Frequency and cost of health, safety and environmental fines / claims

Systems
- Geological modeling, Mine Technical systems
- Budgeting systems, models, etc – ERP

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This core business process describes the key elements of the actual extraction of ore from the mine and transportation of this to the processing facility. This includes sampling, breaking and removal of the broken ore, grading and transportation.
Typical Key performance indicators (KPI’s)

Core Business Processes

- Acquire & Develop Reserves
- Extract Ore
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- Mine Close

KPI’s

- Stockpile turnover ratio
- Grade of ore recovered
- Fines / tones of ore recovered
- Recovery rate; mine call factor
- Percentage capacity utilisation
- Units-of-production per time unit
- Cost per unit output
- Maintenance cost per machine hour

Systems

- Stockpile
  - Metallurgical Extraction / Enrichment / Upgrading

- Maintenance planning
- Mining technical systems
- Process Control
- Metallurgical accounting
- Quality management/grade control
- Production & cost reporting

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Processes in the Mining Business

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Support Business Processes

need to be integrated and support the vision and strategy
Life before a ERP System

High cost, low trust, manual, low adoption, gut decisions

Cost of Complexity
Management of different & scarce skills
Challenges of disparate architecture
No Roadmap to the future – arrive by accident
Data volume is exploding.

Analytics - initially reserved for advanced analysts, accessible to mere mortals now and going pervasive.

Data had to be neatly organized, but comes in all shapes and sizes - now unstructured is a first class citizen.

Application analytics to process analytics.
Enterprise BI Strategy & a Integrated Platform

**Trusted, centralized, high adoption, fact-based, lower cost**

- **Executives**
  - CFO, COO, VP Sales

- **Power Users**
  - Finance, Sales, Supply Chain Analysts

- **Casual Users**
  - Salespeople, CSRs, Warehouse Mgrs.

- **Divisional Mgmt**

- **External Users**
  - Suppliers, Partners, Customers

- **Information management**
  - Teams

- **Operational Systems**
  - SAP ERP, SAP HR, MES

- **BI Platform**
  - BW

- **BI Teams**
  - BI Tool 2 BI Tool 3 BI Tool 4

- **BI Platforms/Tools**

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**Teams**

**Information management**

**Operational Systems**

**BI Platform BW**

- **Data Integration/Data Quality**

**BI Platforms/Tools**

- **Teams**

- **Information management**

- **Operational Systems**

- **BI Platform BW**

- **Data Integration/Data Quality**

- **BI Platforms/Tools**
Integration is important?

Technology needs to enable the core business processes
Why is Integration so important?

- To make decisions on **ONE version of the truth**
- Different information requirements for different levels in the organization
- Disconnection between the business systems and the business processes
- Lack of alignment between the applications of the business systems make it difficult to manage the business
- Roles & responsibilities of the key components of business system applications is not always aligned
- Lack of growth due to a lack of knowledge sharing
Mining companies are changing their technology mindset to get their systems and data organized...
How do we do IT at Samancor Chrome?
The Samancor Chrome pillars

VISION

SHAREHOLDER VALUE

OUR VALUES

Dictate the way we do Business

SHEQ

Organisation Learning & Development

Customer

Business Processes

Growth
The Samancor Chrome pillars

Vision

Shareholder Value

Business Processes

Our values

Enablers:
- Leadership
- Positive attitude
- Enabling environment
- Simple integrated systems

Areas of focus to achieve “Zero harm”

Dictate the way we do business

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Integrated mining Solution at Samancor Chrome

Client:
- Atos
- KPMG Consulting
- GEMCOM

Value Proposition:
- Integration - People
- SAP
- Mine Technical Systems
- BI
- MES & Process Control

- Strategy
- Business Model
- Business Intelligence (BI)
- Strategic Enterprise Management
- Strategic Resource Management (SAP R/3)
- Manufacturing Execution Systems
- Mining Technical Systems

Project Management
- Change Management

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The big picture: Implementing technology

Strategic Management Processes
- Business Intelligence & Strategic Enterprise Management
- Customer Relationship Management

Core Business Processes
- Supply Chain Management - APO
- Resource to Product
- Product to Customer
- Product Life-Cycle Management

Support Business Processes
- Procurement & Supply
- Human Capital Management
- Financial Management
- Asset Life Cycle Management
- SHEQ
- Information Management

Shared Services

to manage according to the Mining Business Model

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Information Maturity Quadrants

1. Data Integrity
   - Overdue Transactions
   - Real-time Transactions
   - Single Data Source
   - Data Cleansing
   - Inside the System
   - Communications
   - Cooperation
   - Data Accuracy
   - Data and Process Accountability
   - User Confidence
   - Lead Time Accuracy

2. Business Rules
   - Data Grouping
   - Stocking Strategy
   - Master Data Rules
   - Service Levels – Internal & External
   - Exception Management
   - Inventory Accuracy
   - Business Measures
   - Design Measures
   - Purchasing & Financial Integration
   - Lead Time Adherence

3. Process Optimization
   - Trusted Automation
   - Enhance Existing Functionality
   - Next Generation Technology
   - Supplier Performance
   - Benchmarking
   - Management Dashboard
   - Global Standardization
   - Supplier & Customer Collaboration
   - Lead Time Reduction

4. Business Value
   - Increase Service
   - Increase Revenue
   - Optimize
   - Inventory Value
   - Improved Inventory Turns
   - Reduce Operating Costs
   - Improved Management Information (Visibility)
   - Increase process optimization & flexibility

Ownership, Accountability, and Governance

Get what was implemented to work as intended. Get the processes integrated

Get the system to work for you, rather than you working for the system

Get the system to work for your business. Set VALUE targets and achieve those targets, using your system

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Barrier to Increased Performance
Lack of visibility through entire cycle

- Strategic Alignment
- Predictable Performance
- Confident Decisions

Strategy

Risks

Opportunities

Execution

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Greatest Business Intelligence Value

When deployed to everyone who can have an impact

Strategic

Gain competitive advantage or major innovation

Tactical/Ad-Hoc

Provide better information to the organization

Enterprise Reporting

Reduce the cost of doing business and improve IT capability

BI Value:

- High performing companies use Analytics as a key strategy element 5 times more than low performers*
- Companies with the highest use of BI achieve above-average Operating Margin in their industry
- Business Intelligence tools increase productivity by an average of 25%
- Salesforce Effectiveness and Financial Management are the most important uses of BI
- Over 80% of companies use a formal BI organization to drive value

Source: Competing on Analytics, Thomas Davenport; ASUG / SAP Benchmarking and Best Practices Survey – Aggregated results are based on 83 total survey submissions

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Think about this...

It is often said that what gets measured gets done. Perhaps so, but it is more accurate to say that only things that are understood get managed!

Gerhard van Niekerk - SAP Labs