Remote Operating Centers: Introduction

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VIRTUAL CONSULTING INTERNATIONAL
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1. Core Elements for ROCs

The benefits of Remote Operating Centres (ROCs) are fully realised as part of an overarching operating model design, and in many cases they are the manifestation or catalyst of this design. This includes the ability to integrate and/ or automate key processes and manage these from a single location.

Core elements of ROC design typically include:

- Data – step-change improvement in capture (sensing) and quality; application and management including real-time management information and reports; information integration
- Visualisation - workflow; data
- Automation - processes; equipment
- Collaboration - technology; work environment; culture; external
- Organisation
- Simulation and optimisation

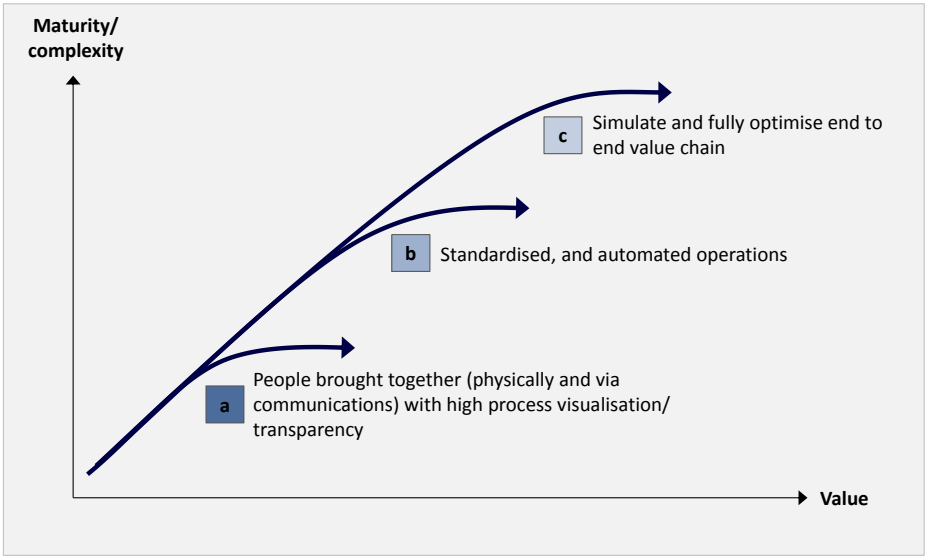
The level of development for individual design elements should be tailored depending on application to maximise return on investment.

2. ROC Maturity Levels

In articulating the benefits of ROC's one can think in terms of 3 main maturity platforms, and value being realised successively as these platforms are delivered:

a) People brought together (physically and via communications) with high process visualisation/ transparency
b) Standardised, and automated operations
c) Simulate and fully optimise end-to-end value chain

Figure 1. Value creation by maturity platform



3. Value of ROCs

ROCs are typically one of the most attractive operational investments available to companies in the resources industry. This result reflects both the significant benefits associated with implementation and the relatively low capital investment required.

The first two maturity levels for ROCs deliver value through a range of sources including:

a) Process optimisation through greater visibility of the 'system' and having operational decision makers connected. Process optimisation typically enables greater throughput/ productivity and can happen at a couple of levels:
   - Individual mine complex
   - Multi mine complex e.g. Rio Tinto's iron ore operations in the Pilbara (multiple mines, rail lines and ports). The value of optimising the multi mine complex is heightened if blending of product between mine products occurs

b) Increased quality/ capability of planning and support through clustering of high quality specialist skills. Improvements typically achieved via:
   - Critical mass of skills enabling further specialisation and allowing capability to be deployed that was not previously available
   - Preferential location making it easier (and often cheaper) to attract more capable people
   - Greater innovation/ collaboration through clustering of capability. Innovation and performance measurably improves when people are densely co-located, a result that is driving the trend for fewer, bigger ROCs across the globe

c) Quicker, ongoing decision making as data can be transformed into real-time management information and reports. Over time this data capture and transformation can be used to create algorithm based predictions

d) Efficiency through automated control/ standardisation. Maintenance costs, fuel consumption, wear rates etc. all improve as process become more stable and consistent

e) Improved safety performance by removing people from high risk environments. The more people can be removed from these environments through automation and ROCs the lower the risk

f) Improved environmental footprint can be achieved by centralising operations at ROCs and automation

The third maturity level can also deliver substantial value improvements, particularly where the complexity of managing/ optimising the end-to-end value chain exceeds human capacity substantially. Broad adoption of ROCs that simulate and fully optimise the end-to-end value chain is not yet common in the mining industry (oil and gas industry is more advanced in certain operations).

Examples of what is possible at this third level of maturity include: optimising drill-hole intelligence with mine plan, production plan, market, emissions, and consumption of inputs simultaneously. This will become increasingly important where sustainability pressures dramatically increases the number of variables that need to be optimised.

4. Benchmark Outcomes

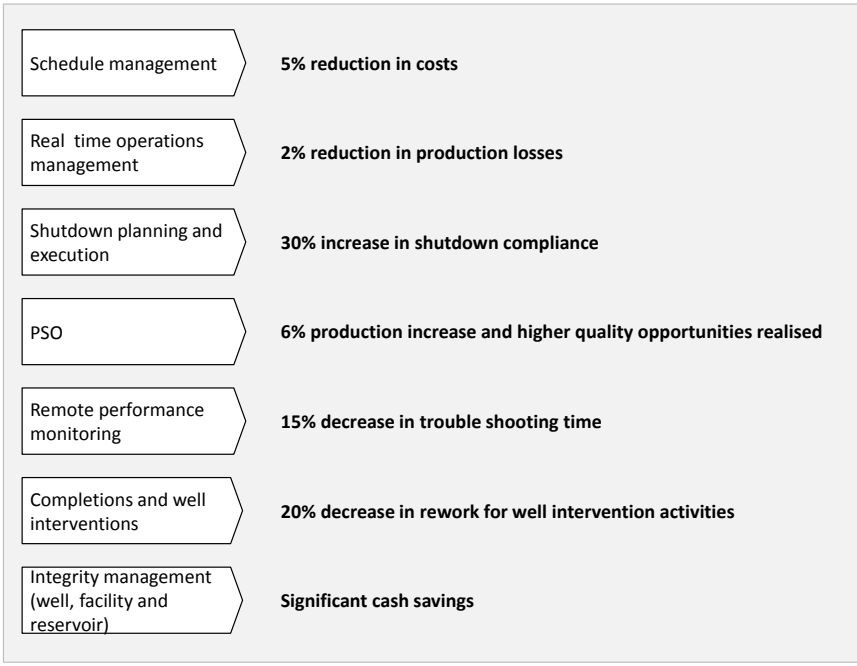
VCI has extensive experience in design and implementation of ROCs globally in the resources industry. Benchmark outcomes evident during this work include:

- Oil and gas companies have typically achieved 3-6% throughput/ productivity improvements with single assets. See figure below for benchmark outcomes from VCI-partner WIPRO's

implementation of ROCs (or CDEs – collaborative decision environments) in the oil and gas industry

- Rio Tinto achieved about a 10% throughput through system optimisation of its iron ore operations in the Pilbara (multiple mines, rail lines and ports), of which the ROC is a foundation. This improvement equates into US$2bn+ margin per year at current ore prices
- IRR for the implementation of a ROC VCI is currently helping design for a major gold company is between 75% (low case) and 150% (high case)

Figure 2. Benchmark outcomes for ROC implementation in the oil and gas industry



5. To Learn More

To learn more about how ROCs could transform your company, please contact any one of the following VCI Global Partners:

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