BHP

Transforming BHP: Technology unlocking value from pit to port

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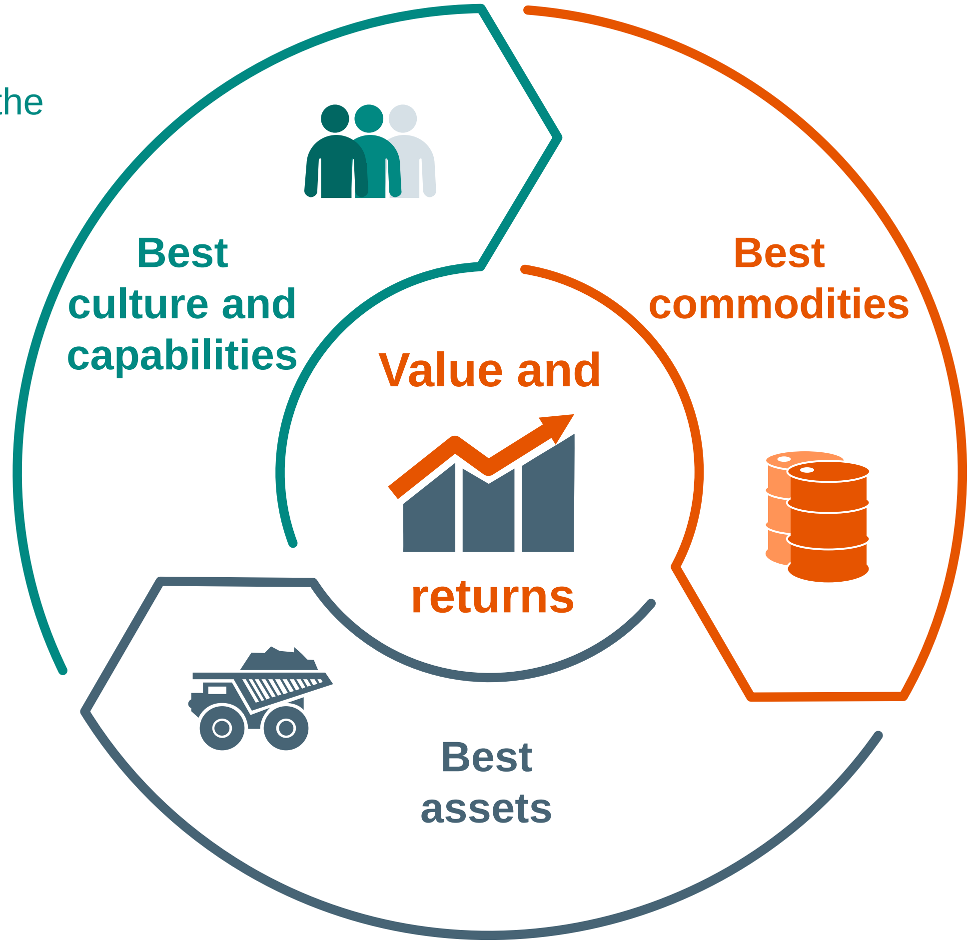
Our strategy to maximise value and returns

To have industry-leading capabilities applied to a portfolio of world-class assets in the most attractive commodities

Culture and capabilities that enable the execution of our business strategy

- ✓ Market intelligence
- ✓ Access, discovery and appraisal
- ✓ Value conversion in operations and marketing



Highly attractive commodities, matched to our capabilities

- ✓ Attractive supply / demand fundamentals
- ✓ Large market sizes
- ✓ Steep cost curves
- ✓ Upstream value chains
- ✓ Differentiated demand drivers

World class assets, uniquely suited to our capabilities

- ✓ Large
- ✓ Long-life
- ✓ Upstream
- ✓ High-margin
- ✓ Expandable

Driven by a commitment to transformation, capital discipline and social value

Unlocking value for BHP through transformation

The world is undergoing significant change… we will be bolder and adapt faster to take advantage of this

Transformation

Ways of work

Culture and capabilities

Strategic and innovative partnerships

Current programs

World Class Functions
- Reduce bureaucracy, fewer silos
- 30% reduction in overhead costs[1]

Centres of Excellence
- Centrally defined global best practice
- Equipment consistently to exceed benchmark

BHP Operating System
- Front-line-led continuous improvement
- Deployed across seven locations by end-FY19

Enhancing our access to capability
- Flexible partnerships to access talent
- Technical and engineering excellence

Value Chain Automation
- Equipment automating
- Decision automation

Innovative solutions for operations
- Address sustainability challenges (e.g. carbon capture, water, tailings)

Shared social and environmental value
- Strategic partnerships for mutual benefit

Outcomes

- ✓ **Operational stability**
- ✓ **Quantum shift in safety, performance and value**
- ✓ **Continued increase in productivity**
- ✓ **Flexibility to rapidly capture opportunities**

Technology

IROCs
Replication accelerating across portfolio

Autonomous trucks
Safety incidents down by 80%[2]

Autonomous drills
Across WAIO

Autonomous TLOs
Additional 2.4t iron ore per ore car

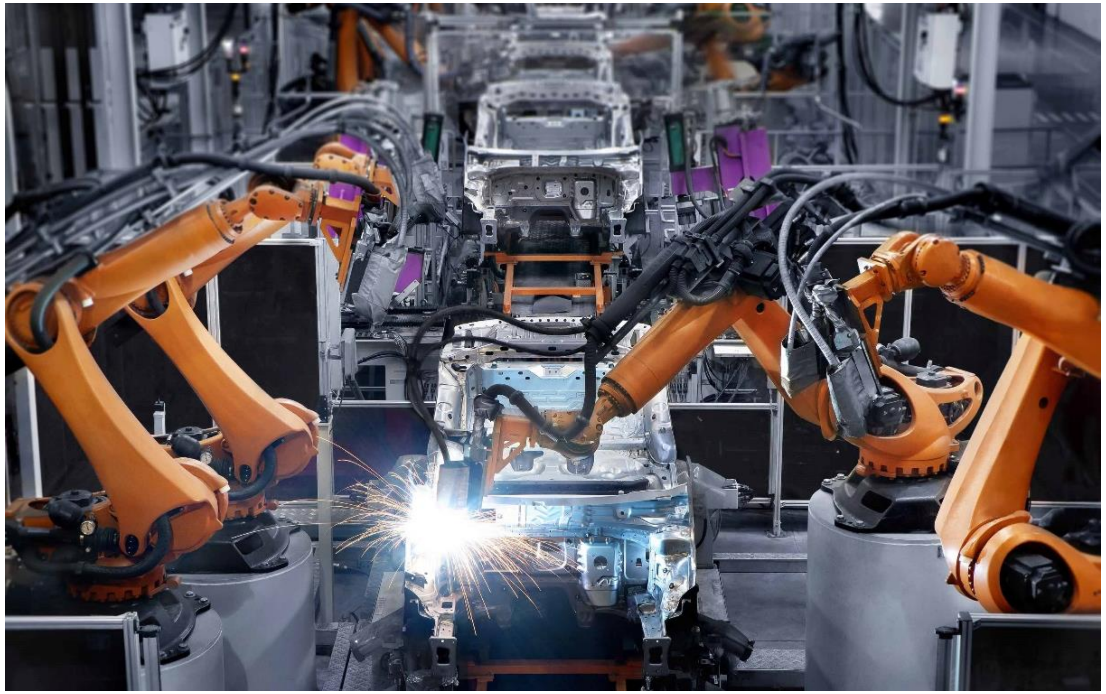
Geophysics modelling
Oak Dam discovery
OBN application

Note: IROC – Integrated Remote Operating Centre; WAIO – Western Australian Iron Ore; TLO – Train Load Out; OBN – Ocean Bottom Node.
1. Represents potential reduction from FY18 in scope Global Function costs. 2. Represents safety incidents reduction in heavy vehicles.

Our vision is to be fully integrated and highly automated

Opportunities to replicate from other industries and accelerate mining specific breakthrough technology

Advanced car manufacturing technology…



…to inform the future of mining

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The transformative power of Technology

Systems approach to the integration and automation of our value chains to unlock resources and drive a step change in safety, volume and cost

EXPLORE & PLAN	EXTRACTION	PROCESS	LOGISTICS	CUSTOMERS
Optimised planning and reduced resource uncertainty	Autonomous and higher productivity systems reduce variability	Improved throughput from advanced process control	Improved scheduling and automated loading with less unplanned events	Meet specific customer demand while maximising realised price

INTEGRATED PROGRAMS

Value Chain Automation

EXPLORE AND PLAN | EXTRACTION | PROCESS | LOGISTICS | CUSTOMER

Getting a clearer view of our ore bodies' future

- Machine learning helps with data interpretation
- Oak Dam copper discovery: uncover additional information in historical data with the help of advanced geophysics modelling and improved data interpretation

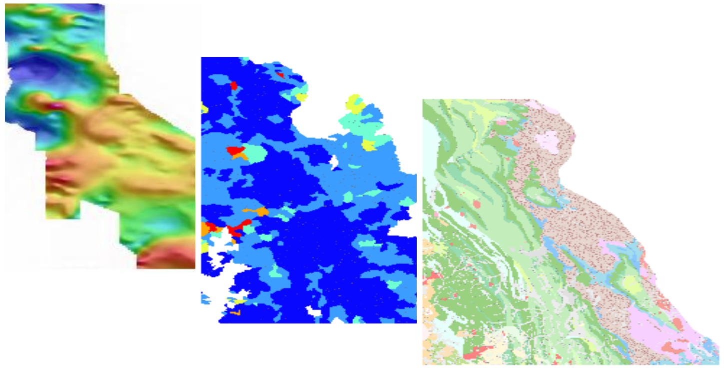
Unlocking future opportunities with advanced seismic imaging

- Ocean Bottom Node survey helps us to navigate the technically challenging and underexplored Western Gulf of Mexico

Shifting data acquisition and analysis to real time

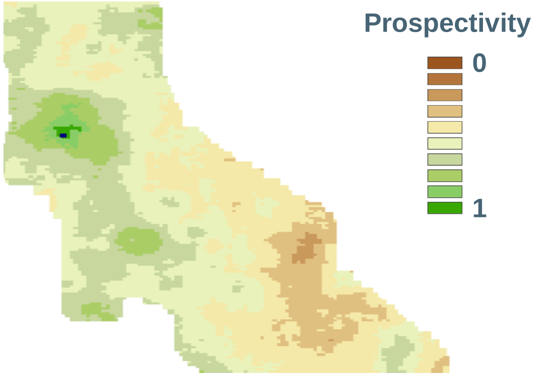
- Live 4D model to update resource knowledge; accessible by other processes along the whole value chain

Geoscience data sources



Machine learning

Machine learning generated targeting aids



Exploration study example in Peru

Value Chain Automation

EXPLORE AND PLAN | **EXTRACTION** | PROCESS | LOGISTICS | CUSTOMER

Safety and productivity through equipment automation

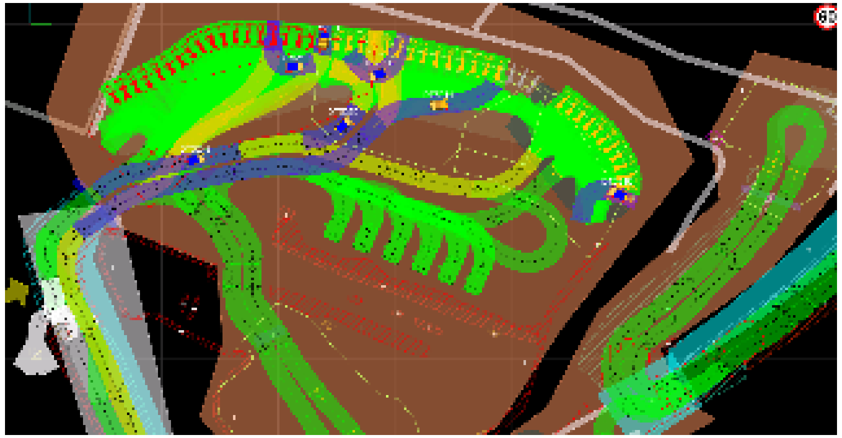
- Autonomous blast hole drill fleet at West Australian Iron Ore
  - 40% reduction in maintenance cost in Autonomous Drill
- Autonomous Haulage at Jimblebar
  - 80% reduction in heavy-vehicle safety incidents
  - 18% increase in truck productivity

Autonomous truck hauling program (feasibility studies phase)

- Automating up to 500 haul trucks across WAIO and Queensland Coal
- First of several investment decisions expected in CY19; total capex of <US$800m (represents full amount)
- Staged rollout between CY20 and CY23

Trucks automatically navigate using pre-defined GPS courses

System continuously calculates actual location, speed and direction of all manned and unmanned vehicles



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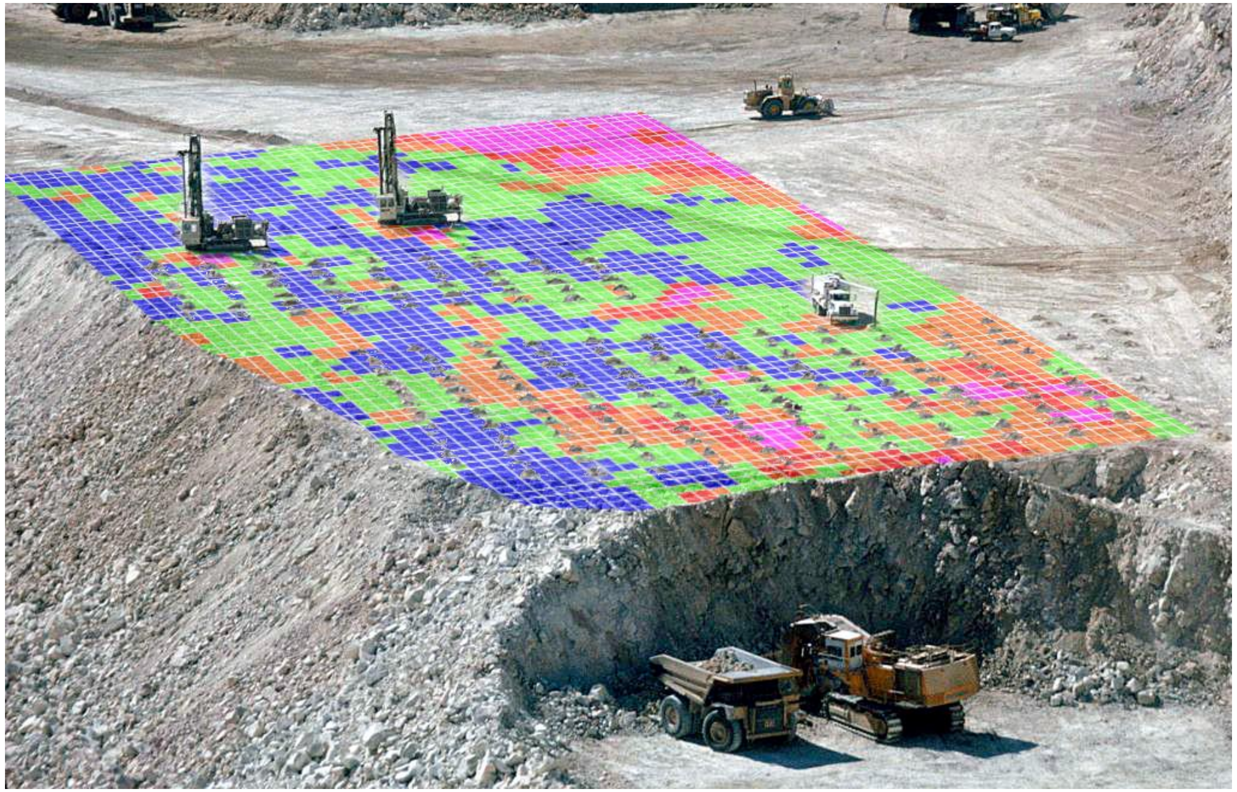
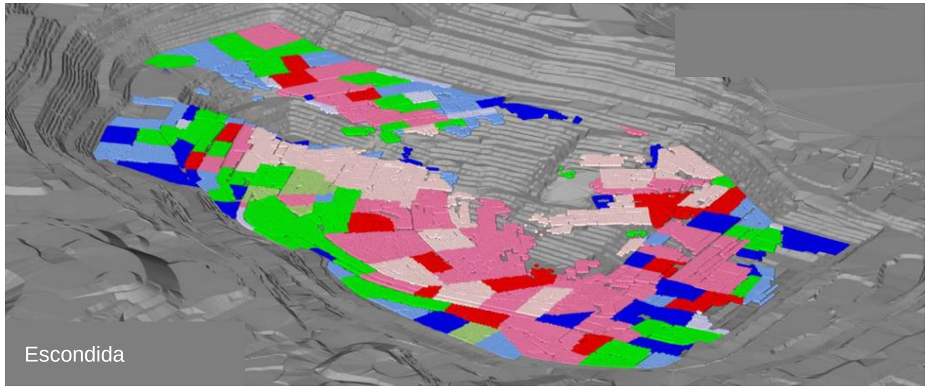
Value Chain Automation

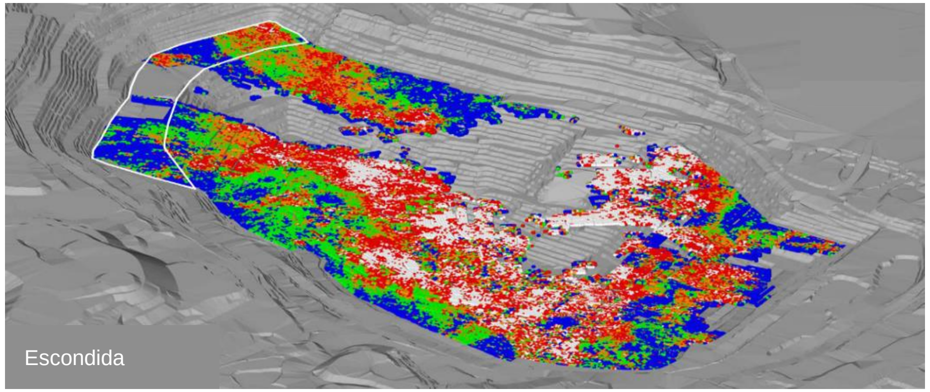
EXPLORE AND PLAN | **EXTRACTION** | PROCESS | LOGISTICS | CUSTOMER

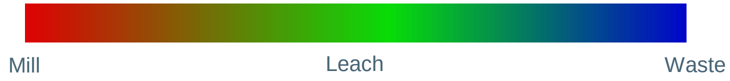
Trialling Precision Mining to unlock value

Sensors and detailed analytics inform extraction decisions at Escondida









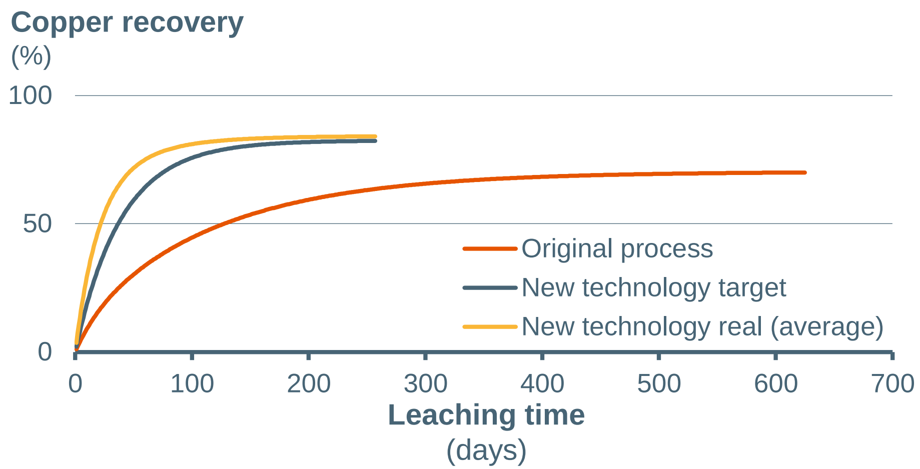
Value Chain Automation

EXPLORE AND PLAN | EXTRACTION | **PROCESS** | LOGISTICS | CUSTOMER

Patented leaching technologies at Spence to replicate across assets

- Increased metal recoveries by 10 - 12%
- Shortened the processing time by almost 50%
- Utilise the full 200 kt of tankhouse capacity

Spence leaching performance



Potential to replicate at Olympic Dam

- Heap leach technology development program successfully completed

Olympic Dam heap leach pilot plant

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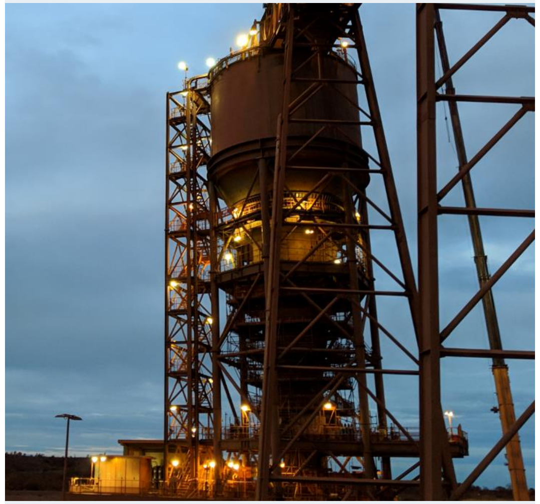
Value Chain Automation

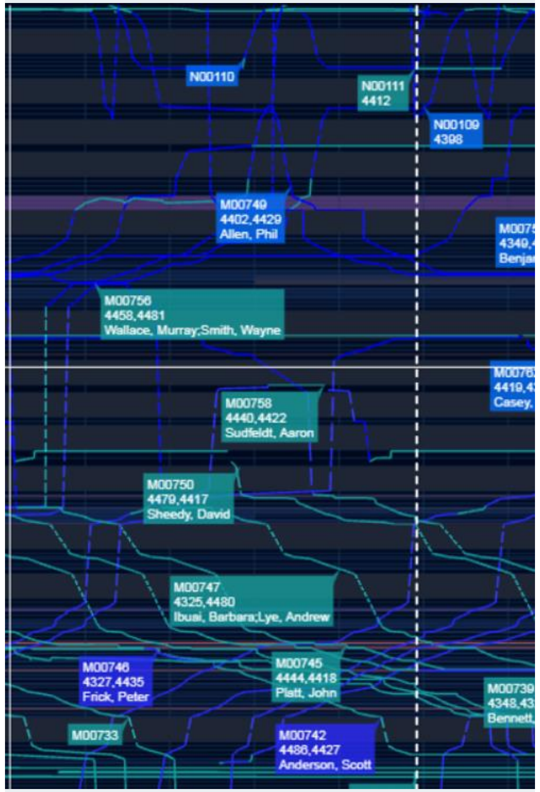
EXPLORE AND PLAN | EXTRACTION | PROCESS | LOGISTICS | CUSTOMER

Volumetric Train Load Out



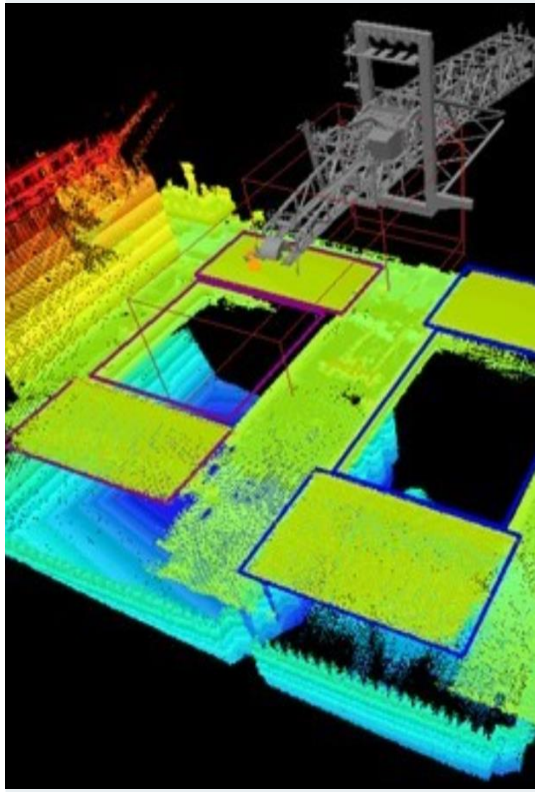
Ore car volume productivity

Rail scheduling algorithms



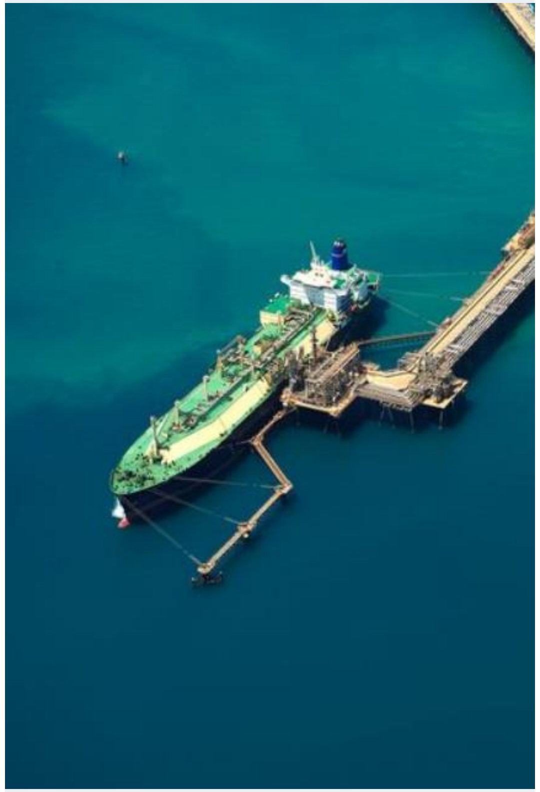
Rail network efficiency

Autonomous ship loader



Loading productivity

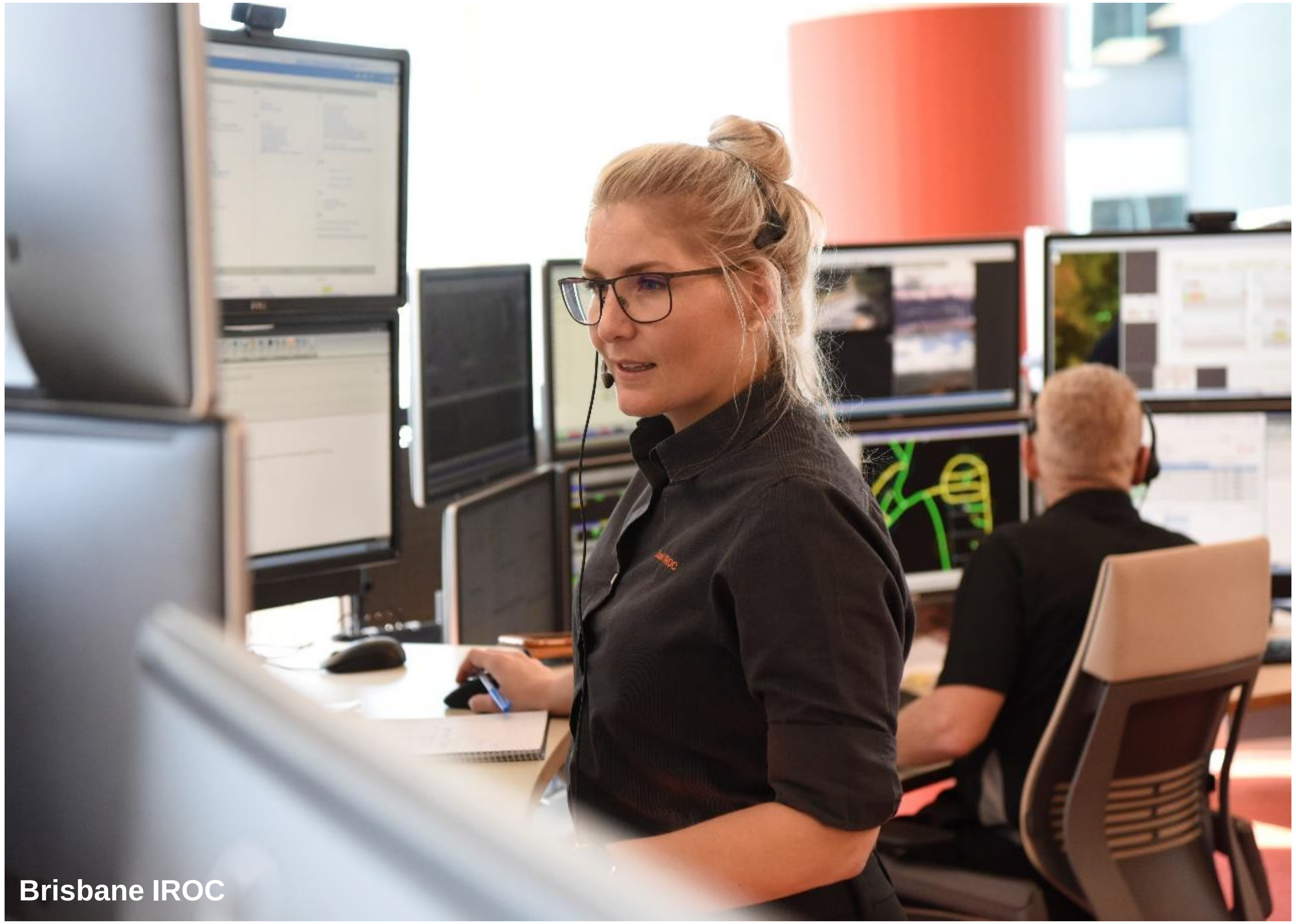
Brand Relativity Evaluation Tool



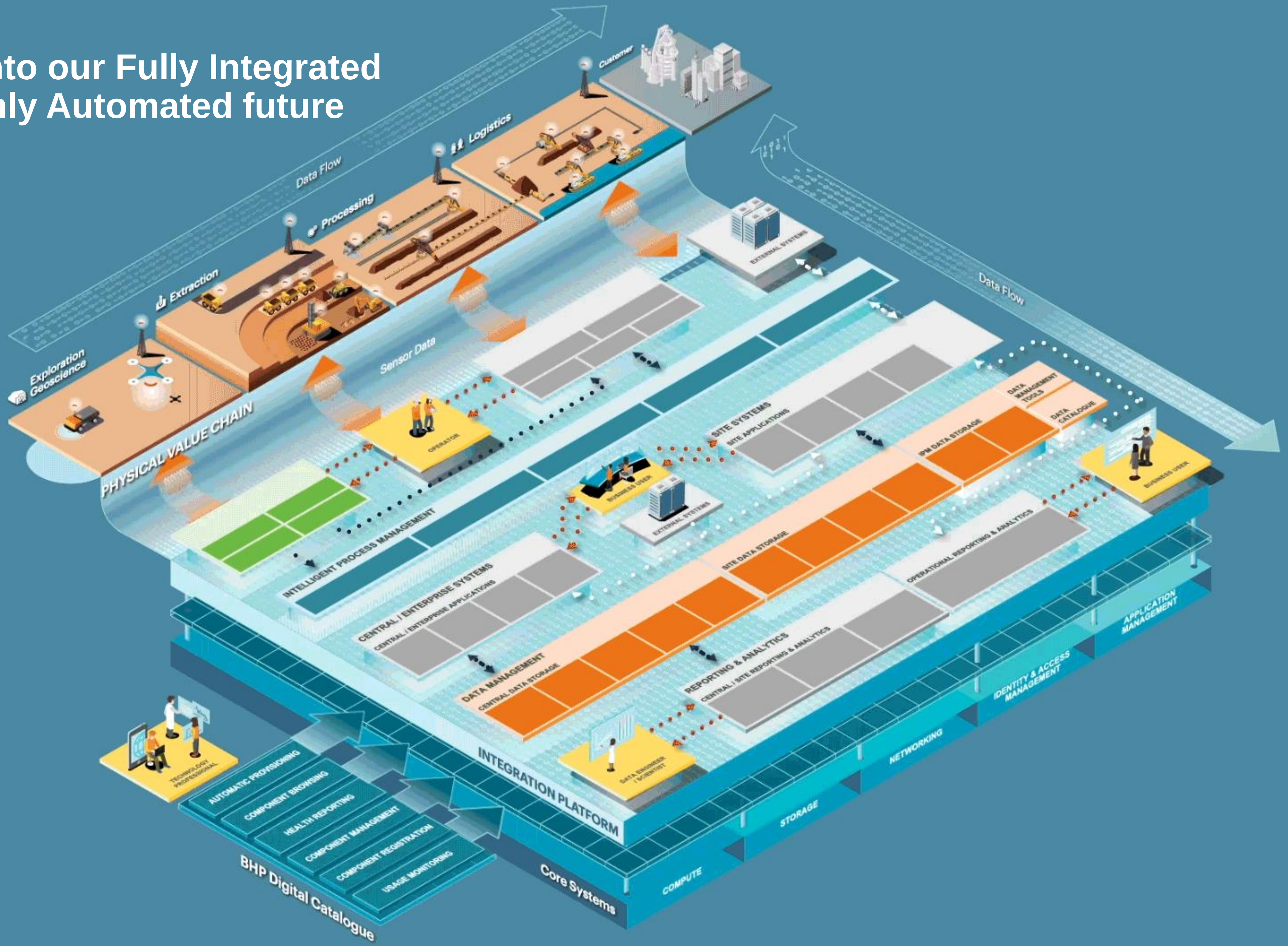
Product strategy optimisation

Social value secures our strategy

Drives transformation and the shift from social 'licence' to 'value'



A look into our Fully Integrated and Highly Automated future



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