



Application of Data Analytics in Mining

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What is Data Analytics?

The process of analysing raw data in order to draw out meaning and insights.

CLEAR PURPOSE - analysing data without an outcome in mind is unproductive

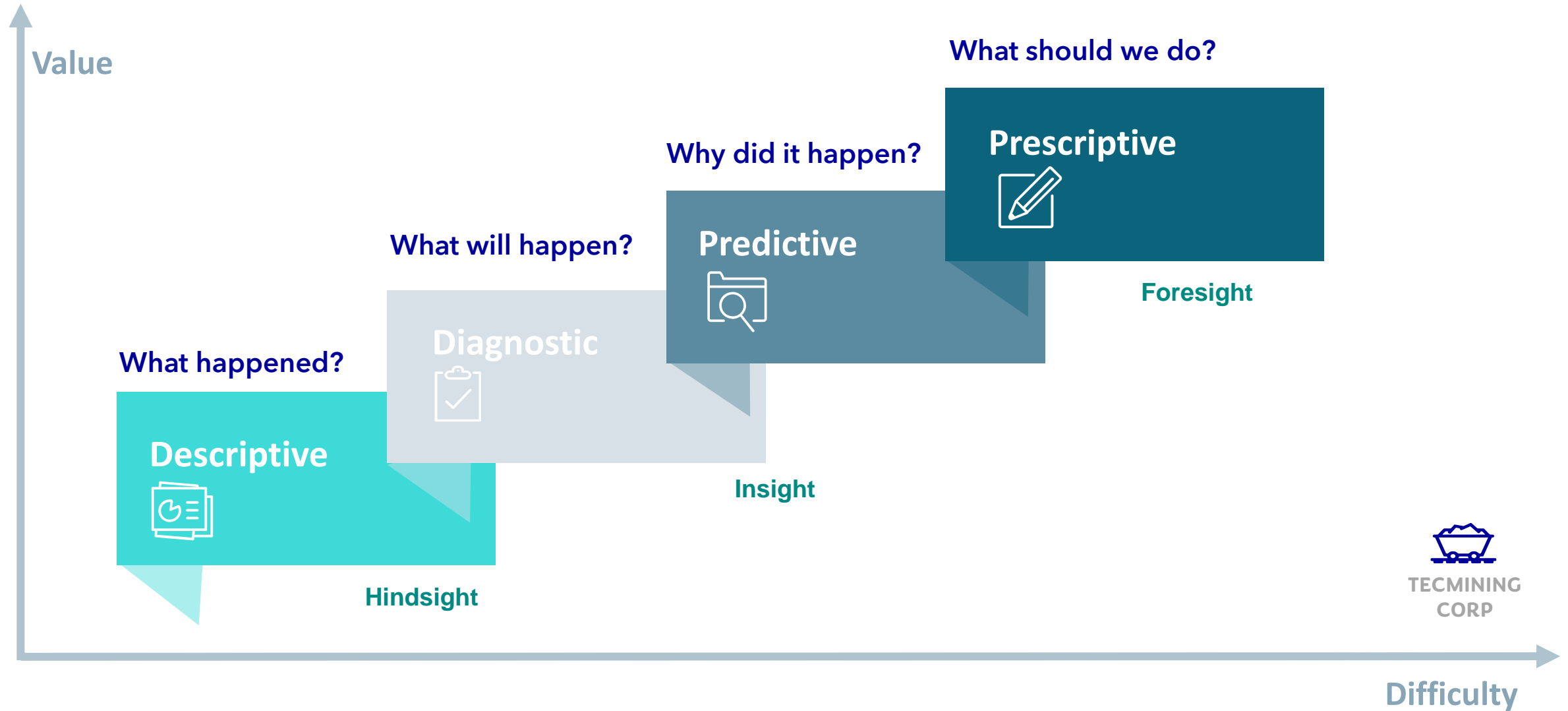
COMMUNICATE INSIGHTS – the *'so what?'*

Data analysis is mostly focused on:

- Understanding the **past** or the **present** to track and improve current success
- Looking to the **future** to predict events or prescribe actions



The Progression of Analytics



Descriptive Analytics - Discovering the Past



Problem Statement

TecMining Corp has a vast repository of historical data on ore grades from various mining sites.

The GeoSciences team is looking to utilise descriptive analytics, to analyse this data to:

- **identify trends** in ore quality over time,
- pinpoint locations with the highest-grade ore, and
- optimize resource allocation for **maximum efficiency**

Use Case 1: Ore Grade Analysis



Diagnostic Analytics - Understanding the "Why"



Problem Statement

TecMining Corp has experienced an unexpected equipment failure at one of their mines.

The Maintenance team is looking to employ diagnostic analytics to explore maintenance records, environmental factors, and other relevant data to **pinpoint the underlying reasons** for the failure.

This knowledge allows them to **take preventive measures** and minimize downtime.

Use Case 2: Equipment Failure Investigation

Predictive Analytics - Forecasting the Future



Problem Statement

TecMining Corp wants to make **informed forward-facing decisions** about resource extraction, expected project timelines, and financial planning.

The Data Science team can apply predictive analytics to the geological data extracted previously to **estimate future ore reserves accurately**.

Use Case 3: Ore Reserves Estimation



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Prescriptive Analytics - Shaping Optimal Strategies



Problem Statement

TecMining Corp can **optimize the mining route**, considering factors like ore quality, transportation costs, and environmental impact.

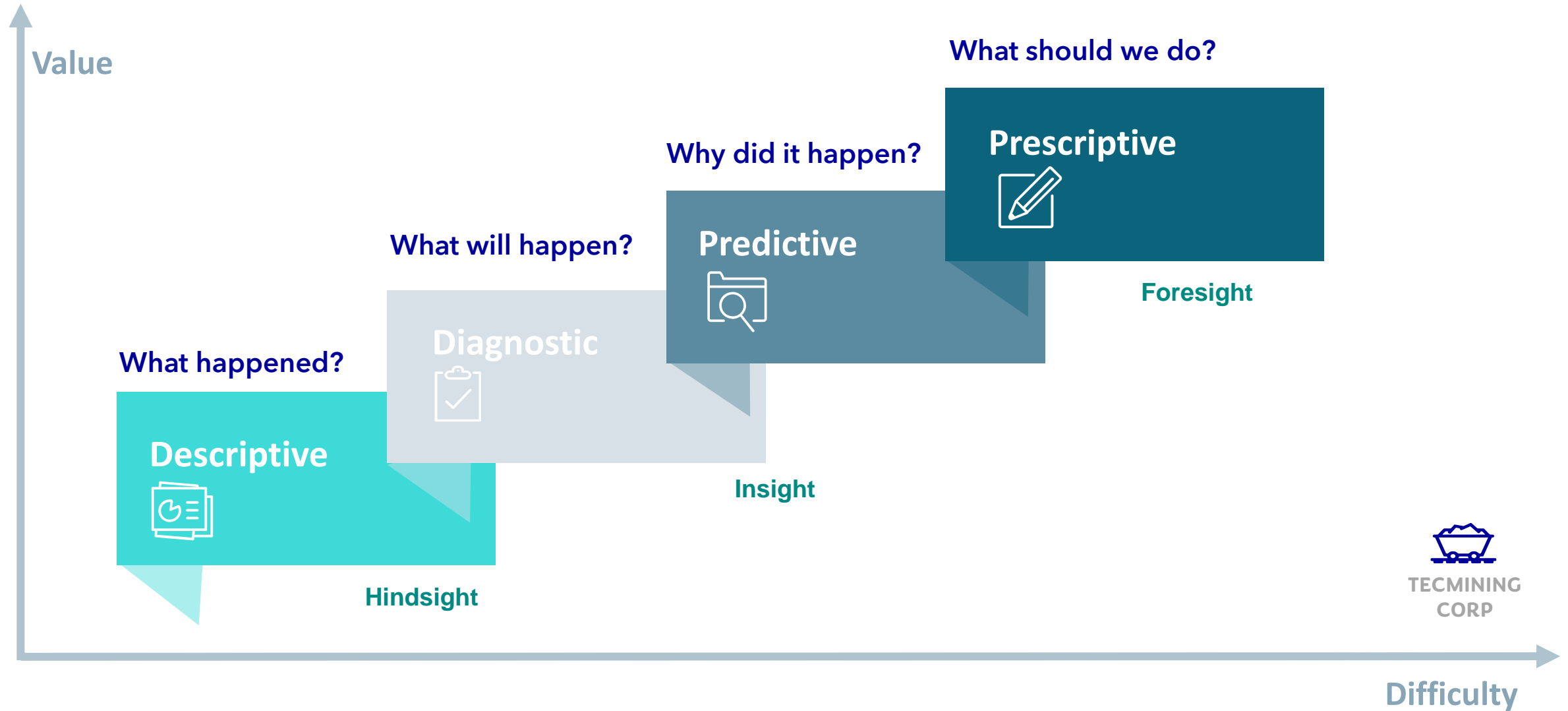
This ensures a more **efficient and sustainable mining operation**.

Use Case 4: Optimal Mining Route



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The Progression of Analytics



Future Job Requirements for Data Analytics Professionals

Key skill sets and job requirements for data analytics professionals in the coming years.



- Strong Data Science Knowledge
- Domain Expertise
- Data Visualization Skills
- Machine Learning and AI
- Problem-Solving Aptitude
- Ethics and Privacy Awareness
- Communication and Stakeholder Engagement

Questions