//ADASTRA

Mine of the Future

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Adastra Approach

! Growing skills gap & deteriorating assets

Dynamically changing customer needs & product variability
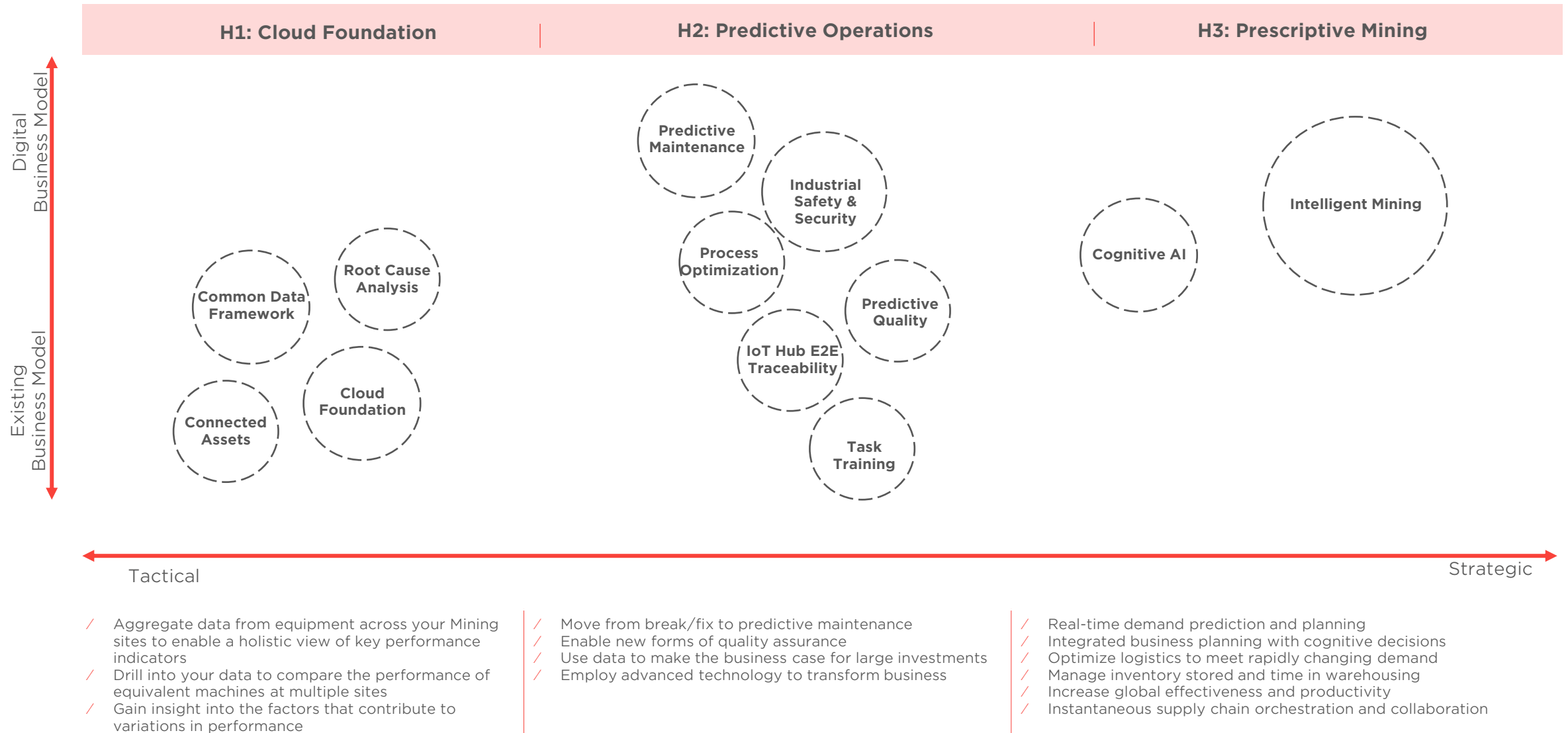
Eroding margins & rising costs

✓ Improved reporting, more natural interfaces, and efficient training.

Predictive inventory management, customized quoting.

Increased operational efficiency, automatic asset maintenance, and less replacements.

Horizons Of Mine Of The Future

H1: Cloud Foundation	H2: Predictive Operations	H3: Prescriptive Mining

Digital Business Model ↑ / **Existing Business Model**

- Common Data Framework
- Root Cause Analysis
- Connected Assets
- Cloud Foundation
- Predictive Maintenance
- Industrial Safety & Security
- Process Optimization
- Predictive Quality
- IoT Hub E2E Traceability
- Task Training
- Cognitive AI
- Intelligent Mining

Tactical ← → Strategic

- / Aggregate data from equipment across your Mining sites to enable a holistic view of key performance indicators
- / Drill into your data to compare the performance of equivalent machines at multiple sites
- / Gain insight into the factors that contribute to variations in performance

- / Move from break/fix to predictive maintenance
- / Enable new forms of quality assurance
- / Use data to make the business case for large investments
- / Employ advanced technology to transform business

- / Real-time demand prediction and planning
- / Integrated business planning with cognitive decisions
- / Optimize logistics to meet rapidly changing demand
- / Manage inventory stored and time in warehousing
- / Increase global effectiveness and productivity
- / Instantaneous supply chain orchestration and collaboration

Adastra Solutions

Horizon 1:
Enterprise Analytics For Self-Service BI

Sustainability Benefit: Thru KPI's, track and improve mining yields, reducing environmental impact for the same output

PROBLEM
Existing 300+ mining customers required a locally installed and managed reporting / analytic solution. Local deployment caused significant overhead, higher support costs, slow new capability integration, and limited capabilities for customers.

SOLUTION
Created a centralized analytics platform, collecting real time telemetry data from 300+ mines, to support both live (warm) and historical (cold) path analytics. Introduced new advanced analytic capabilities to customers, and provided a better user experience.

RESULTS
Customer productivity increased by leveraging analytic data, enabling proactive maintenance and more efficient equipment use. New analytic services became a differentiator for the miner.
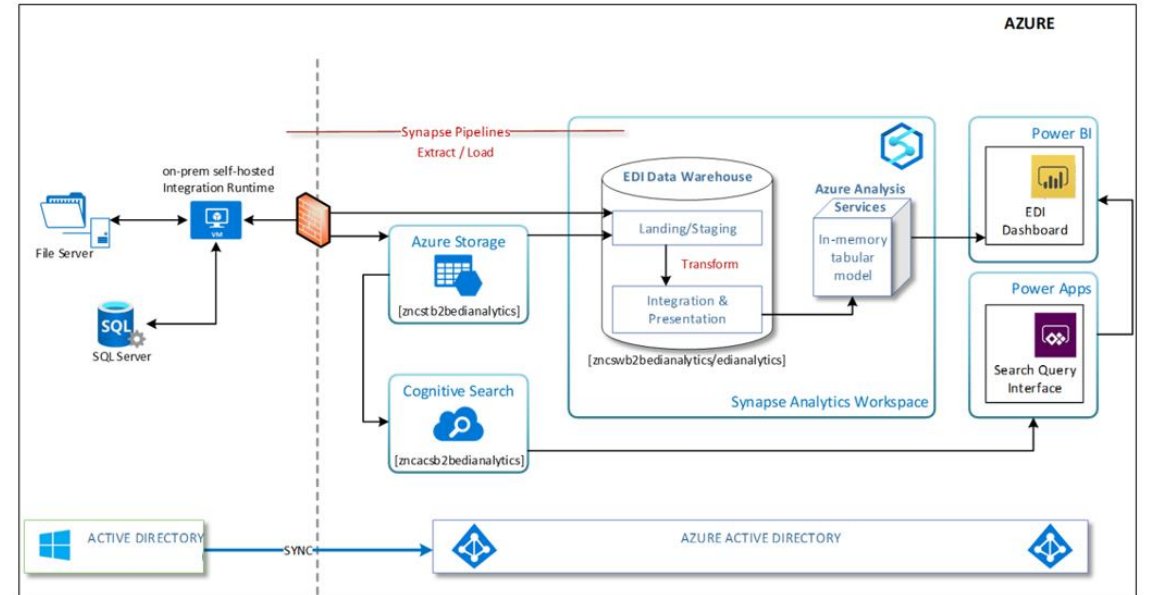
Horizon 1:
Quick and Efficient Enterprise Search

Sustainability Benefit: Enable quick, self service, global, electronic access to relevant content, avoiding travel and use of paper

PROBLEM
With limited visibility into existing millions of EDI transactions and documents, searching and reporting on relevant data is difficult and time consuming.
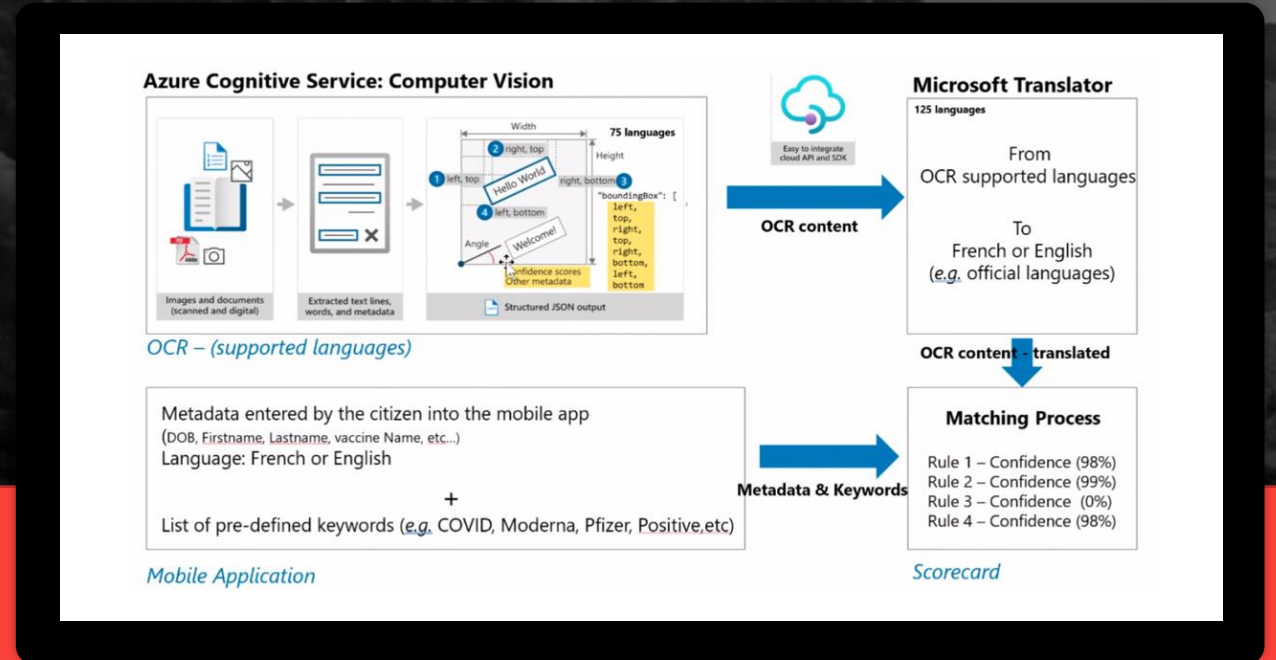
SOLUTION
EDI Data Lake, search and reporting solution with an Azure Framework to populate with EDI transactions and documents in common business formats. Establish EDI processing via Cognitive Search, Synapse Provisioned SQL Pool and Azure Data Lake Index and connect the documents to enable search.

RESULTS
Improve productivity by providing a real-time searchable database with powerful Power BI reporting and alerting processes. Avaialble applications that can compare current and historic purchase orders to compare changes. Find relevant content in minutes rather than days.

Azure Cognitive Service: Computer Vision

75 languages

Width
Height

Hello World
Welcome!
Angle
Confidence scores
Other metadata

"boundingBox": [
left,
top,
right,
top,
right,
bottom,
left,
bottom

Images and documents (scanned and digital)

Extracted text lines, words, and metadata

Structured JSON output

OCR – (supported languages)

OCR content

Easy to integrate cloud API and SDK

Microsoft Translator

125 languages

From OCR supported languages

To French or English (*e.g.* official languages)

OCR content - translated

Metadata entered by the citizen into the mobile app
(DOB, Firstname, Lastname, vaccine Name, etc...)
Language: French or English

+

List of pre-defined keywords (*e.g.* COVID, Moderna, Pfizer, Positive,etc)

Mobile Application

Metadata & Keywords

Matching Process

Rule 1 – Confidence (98%)
Rule 2 – Confidence (99%)
Rule 3 – Confidence (0%)
Rule 4 – Confidence (98%)

Scorecard

Horizon 1:
Text Translation of
Global Documents

Sustainability Benefit: Enable quick, self service, global, electronic access to translated content, avoiding travel and use of paper

PROBLEM
Global mining organizations will keep information in different languages, worldwide, making identifying and collating information a strenuous task.

SOLUTION
Leveraging Azure Cognitive Services "Computer Vision" and "Language Translation", through Adastra's real time / API solutions, documents are automatically translated from 175 different languages to the required target language, enabling global access to critical content.

RESULTS
Improved organizational knowledge sharing and decision making, by removing language barriers as a blocker. Make better mining business decisions by leveraging global knowledge.

Horizon 2:
Anomaly Detection During Material Processing

Sustainability Benefit: During processing, detect anomalies and stop failing production, avoiding waste and scrap

PROBLEM
Miners lack visibility into the production quality of their supply chain, leading to significant scrap if not identified and prevented (e.g. during metal coil production)
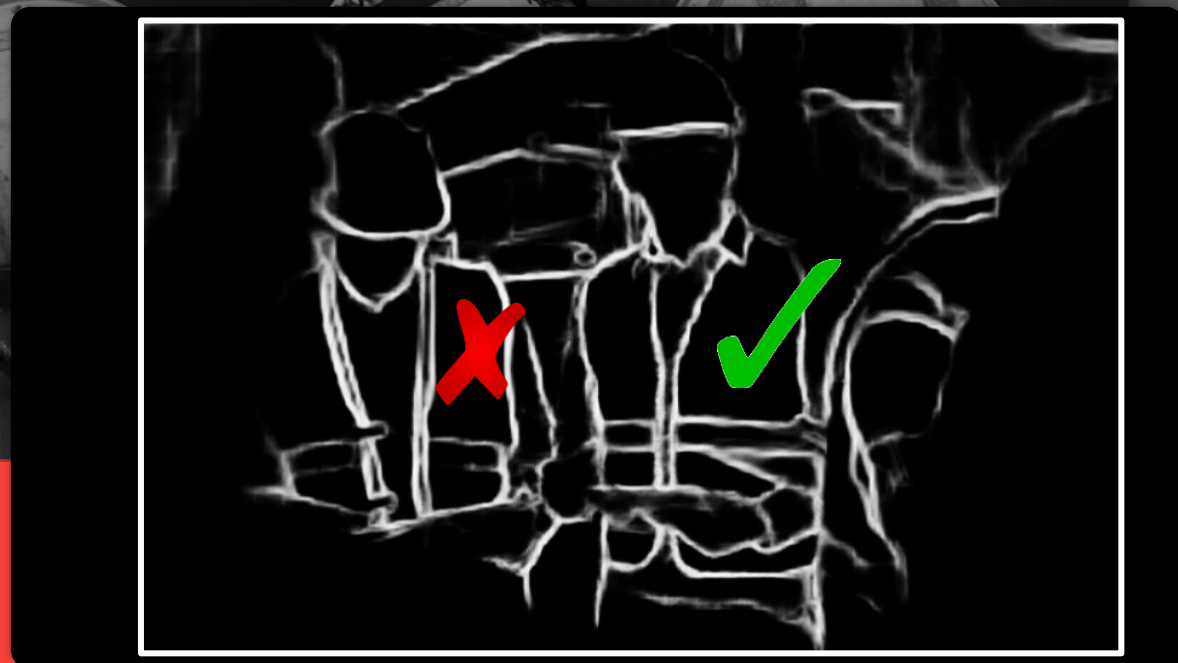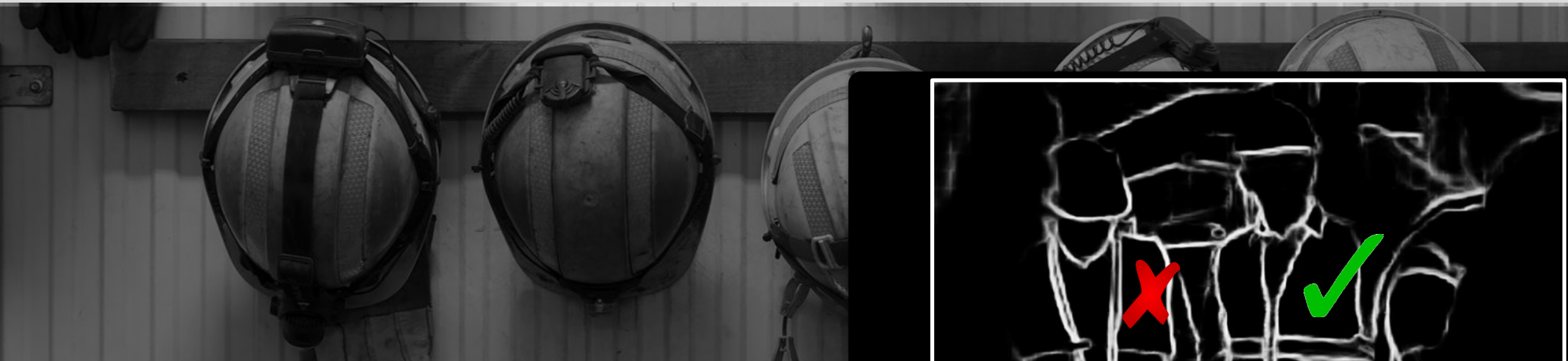
RESULTS
Use AI to monitor streamed images, to identify anomalies in the mining process, stopping production and preventing wasted scrap. Provide visibility to the process via a Power BI dashboard, monitored by the line manager.

OUTCOME
Significant cost reduction in scrap, as intervention can be taken directly during the manufacturing process.

Horizon 2:
Anomaly Detection of Safety Procedures

Sustainability Benefit: Maintain mine efficiency thru safe working environments

PROBLEM
Without proper use of Personal Protective Equipment (PPE) such as high visibility safety apparel, there is an increased risk of injury to workers operating in different mining environments

SOLUTION
Implement a computer vision-based detection model which leverages advanced image processing and object detection techniques to identify safety vests in mining site video streams, coupled with edge detection methods to flag vests which are not properly secured. Enable a notification system which notifies site managers when there is a safety risk.

RESULTS
Reduced safety risk to mining employees through enhanced monitoring of safety vest adherence, leveraging video analytics and computer vision capabilities.

Drill and Blast Optimization
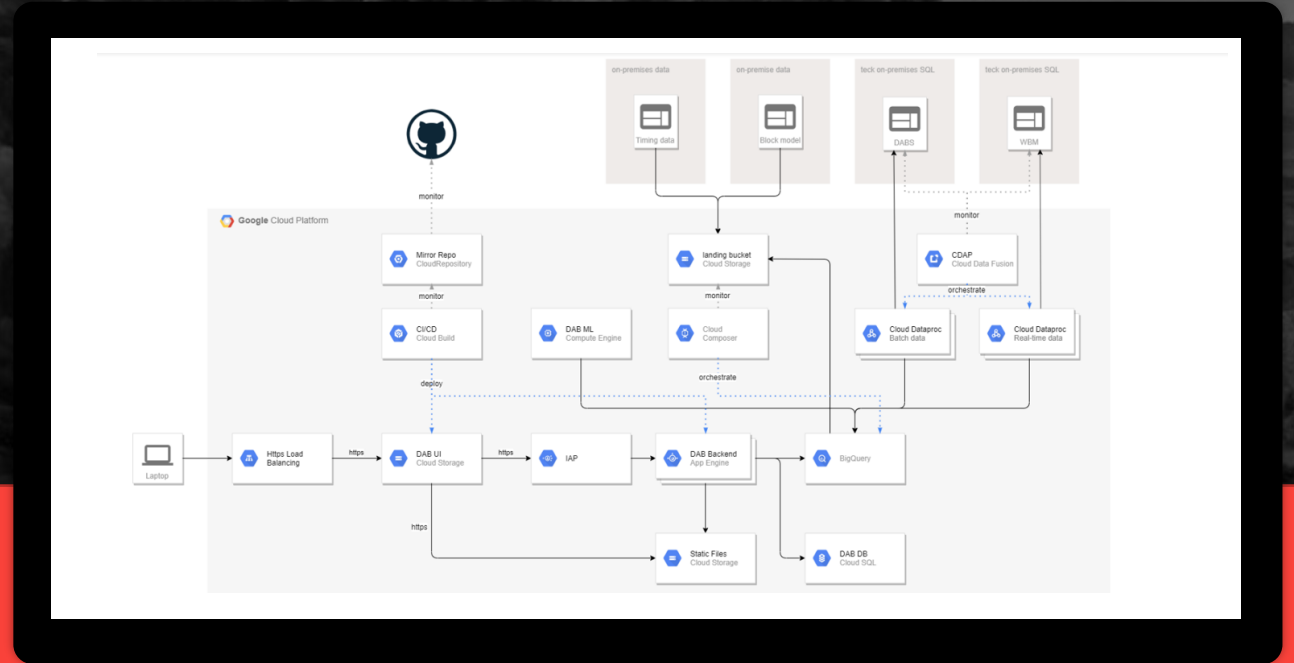
Horizon 2:
Production Optimization

Sustainability Benefit: Optimize yields thru more efficient use of existing equipment and material

PROBLEM
Mines are increasingly focused on driving efficiency and productivities at their drill and blast sites but lack the data-driven insights to make optimal pattern design decisions.
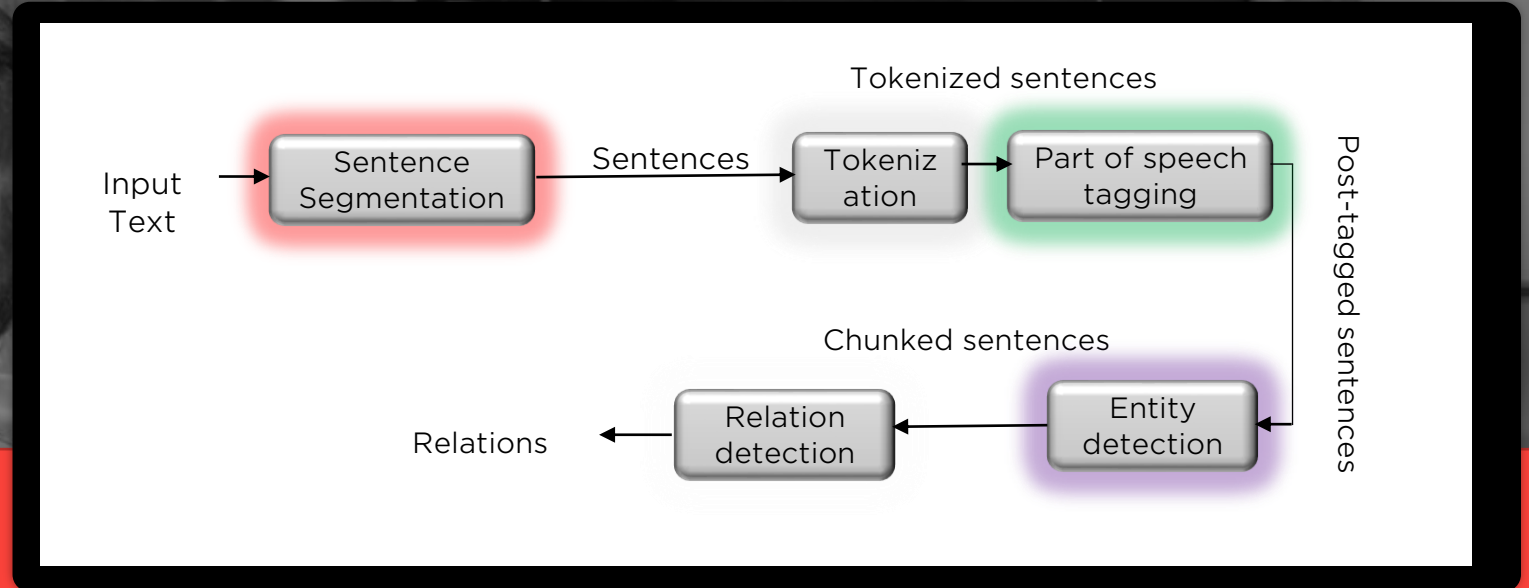
SOLUTION
Implement a decision making web application tool that leverages a variety of parameters, including historical data, burden spacing, shovel efficiency, blast KPI's, etc., providing analytics and recommendations

RESULTS
Mines are empowered to reach optimal yields / rock fragmentation, and reduce blast costs, with data-driven insights. Provided visualization for hole patterns, KPI reports, blast predictions, recommendations on drilling intensities, and post blast analysis.

Tokenized sentences

Input Text → Sentence Segmentation → Sentences → Tokenization → Part of speech tagging

Post-tagged sentences

Chunked sentences

Relations ← Relation detection ← Entity detection

Horizon 3:
Use AI Driven Knowledge Mining to Expand Insights

Sustainability Benefit: Enable quick, self service, global, electronic access to translated content, avoiding travel and use of paper

PROBLEM
Miners have limited visibility into their backoffice documents, making locating information intensive and time consuming.

RESULTS
Build a series of AI-power intelligence modules that can be surfaced through a REST API for inference and incorporation into downstream processes

OUTCOME
Accelerated time to find relevant information that supports the generation of their safety standard documents as well as to automate their templates
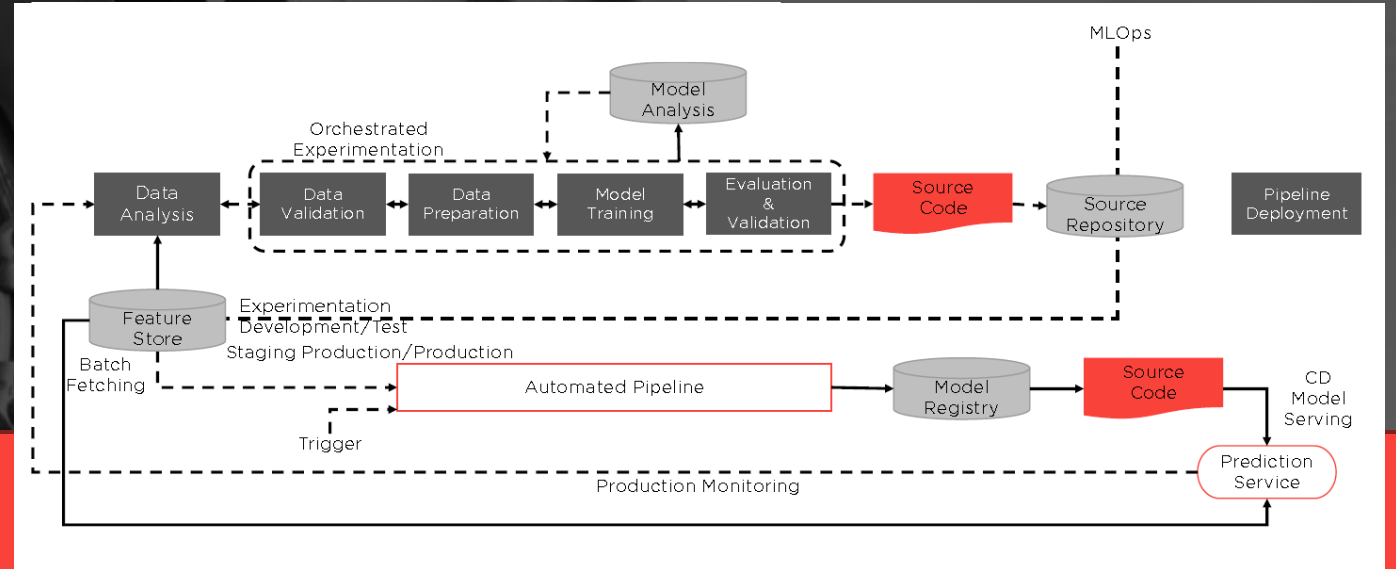
Horizon 3:
Predictive Maintenance for Improved Machine Availability

Sustainability Benefit: Through effective maintenance, improve machine lifespan and avoid machine replacement

PROBLEM
Unexpected disruptions, caused by machine failure can have major cost implications in the production and can impact an organization's ability to meet targets.
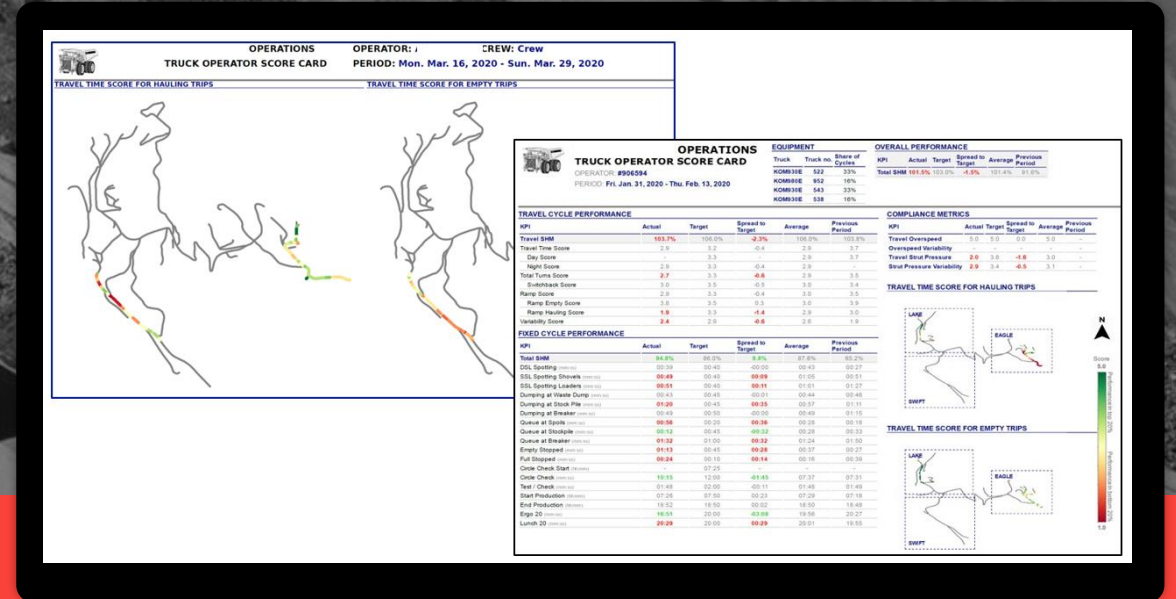
SOLUTION
Use of text classification and machine learning methods to analyze historical data and recommend the best solution. Implementation of an intelligent assistant for mobile devices that suggests recommended steps to solve the problem.

OUTCOME
Improved incident response time by >20% and downtime minimization, **saving >$5M per year in averted expenses**.

Horizon 3:
Asset tracking and route optimization for elevated performance

Sustainability Benefit: Achieve more efficient outputs from existing machinery, reducing total machine count

PROBLEM
Vehicles are not being used at the fullest extent at manufacturing and mine sites, due to lack of visibility of truck operator.

SOLUTION
Collect IoT data in real time, from trucks, to track how they are performing on routes/ load delivery, modern data warehouse in Azure. Compare truck operator performance against other truck operators, to determine where additional training can help improve poorly performing operators.

RESULTS
Improved truck operator performance at sites by 5%, optimizing truck assets more effectively and reducing overall truck costs, **realizing >$8M / year in value from existing assets**.
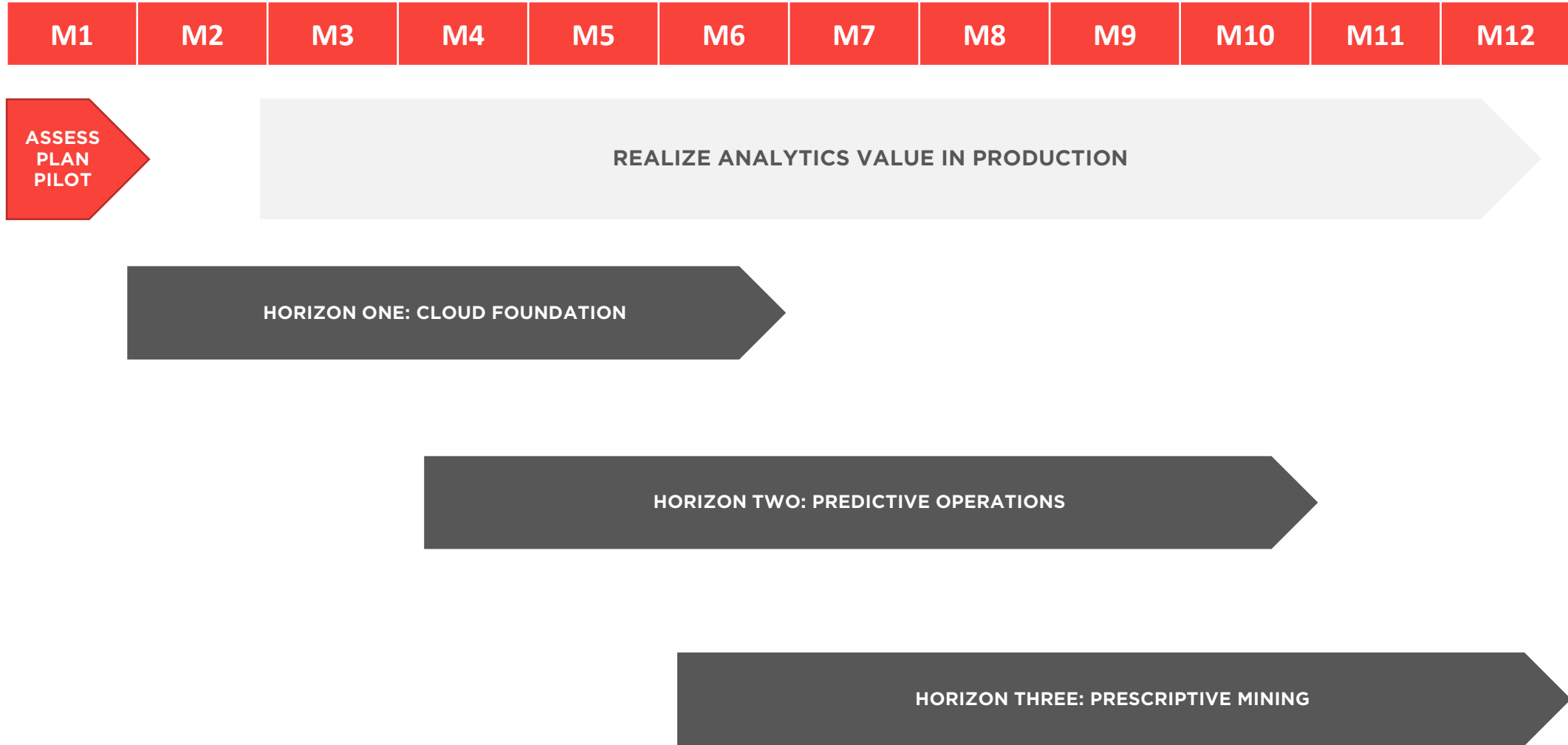
Getting Started

About Adastra

Adastra: Go-To Partner for Data & AI

Microsoft IMPACT Award Recipient:
- 2021 Analytics Impact Award
- 2021 AI Impact Award
- 2021 Data Platform Modernization Award
- 2020 / 2019 Commercial Partner of the Year
- 2019 Manufacturing Innovation Impact Award

Azure Migration Partner

Advanced Specialization for Analytics

Advanced Specialization for Windows / SQL Server Migration to Azure

Lead Canadian Partner for Synapse Migration / Implementation

Product Team Collaboration for Azure Synapse / Azure Purview / Azure Databricks

Microsoft
Partner

Microsoft

Gold Data Analytics
Gold Data Platform
Gold Cloud Platform
Gold Datacenter
Gold Application Integration

Adastra Difference

Client Focused

Strategy Focused
We develop solutions that meet client's current and future business needs.

Value Driven
We deliver data-driven value to our customers with measurable ROI.

Nimble
We share knowledge and expertise with nimble work structures that allow us to scale as needed.

Transparent
We work with our clients to manage scope, timelines and level of detail.

Best-In-Class Solutions

End-to-End Data Services
We provide services from inception to deployment and maintenance for effortless client execution.

Excellence of Execution
Nothing matters if it can't be delivered on time, on budget, and within scope.

Top Talent
We hire only the best and the brightest and invest in their training and development.

Best Shoring
Top global experts can be assigned to take advantage of economies of scale and provide 24/7 delivery.

Data   AI & Analytics   Cloud   Governance   Digital