Azure and ML in Oil and Gas Industry

13-June-2021

Agenda

- **Oil Industry**
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- **Azure**
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  - C Azure Cognitive Skills
  - D Azure ML
- **Use Cases**
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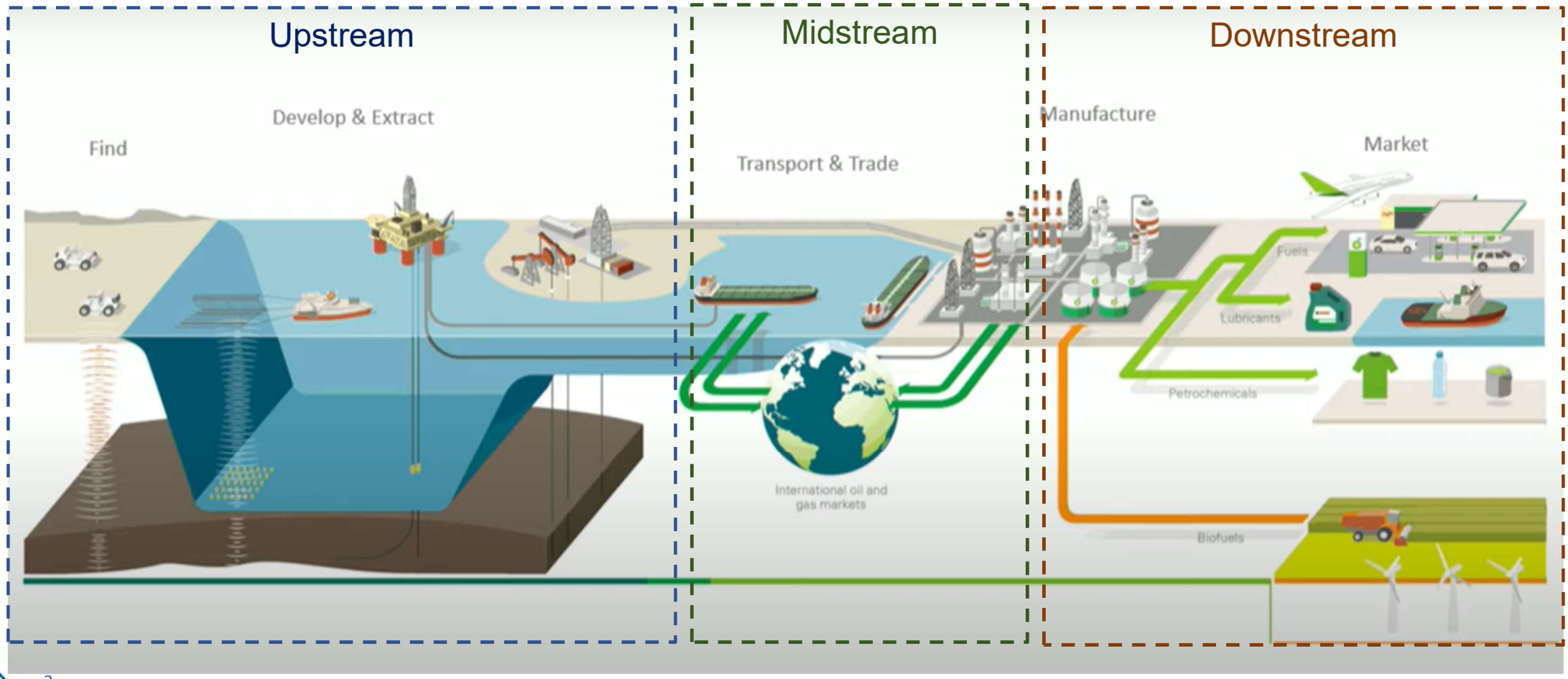
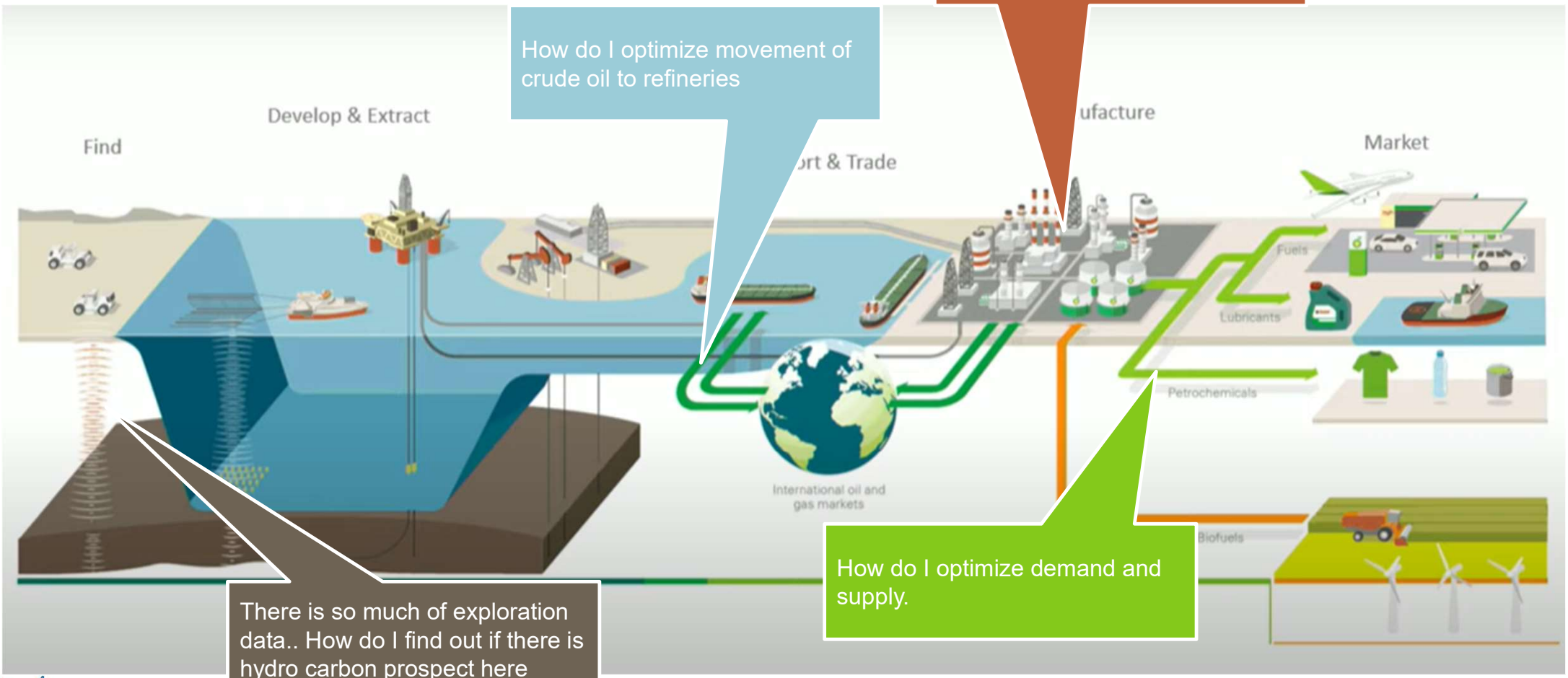
  - B Forms Extraction
  - C Well Blowout

Oil Industry

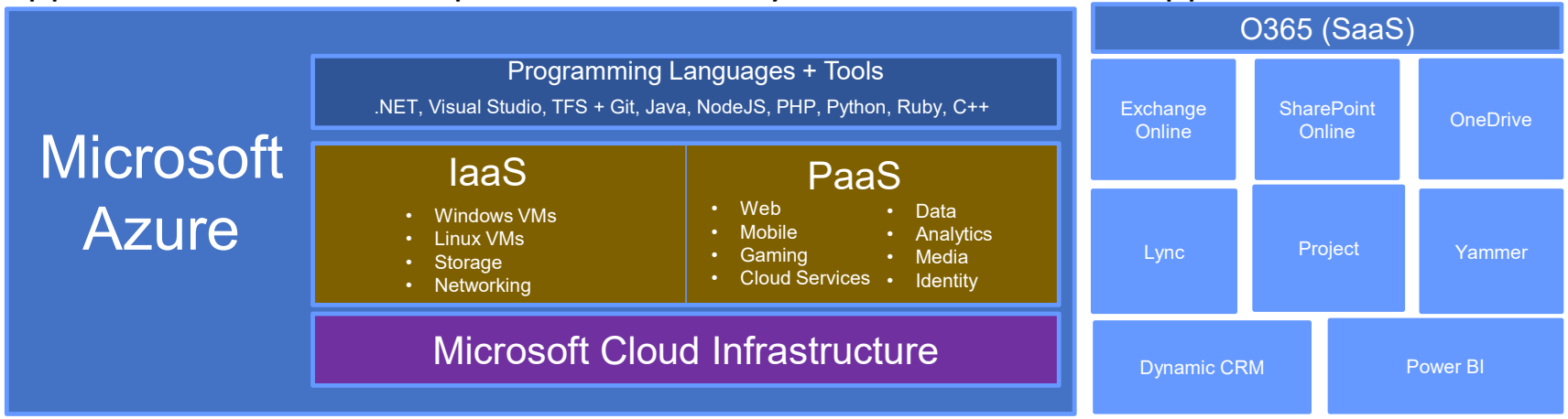


Oil Industry Problems

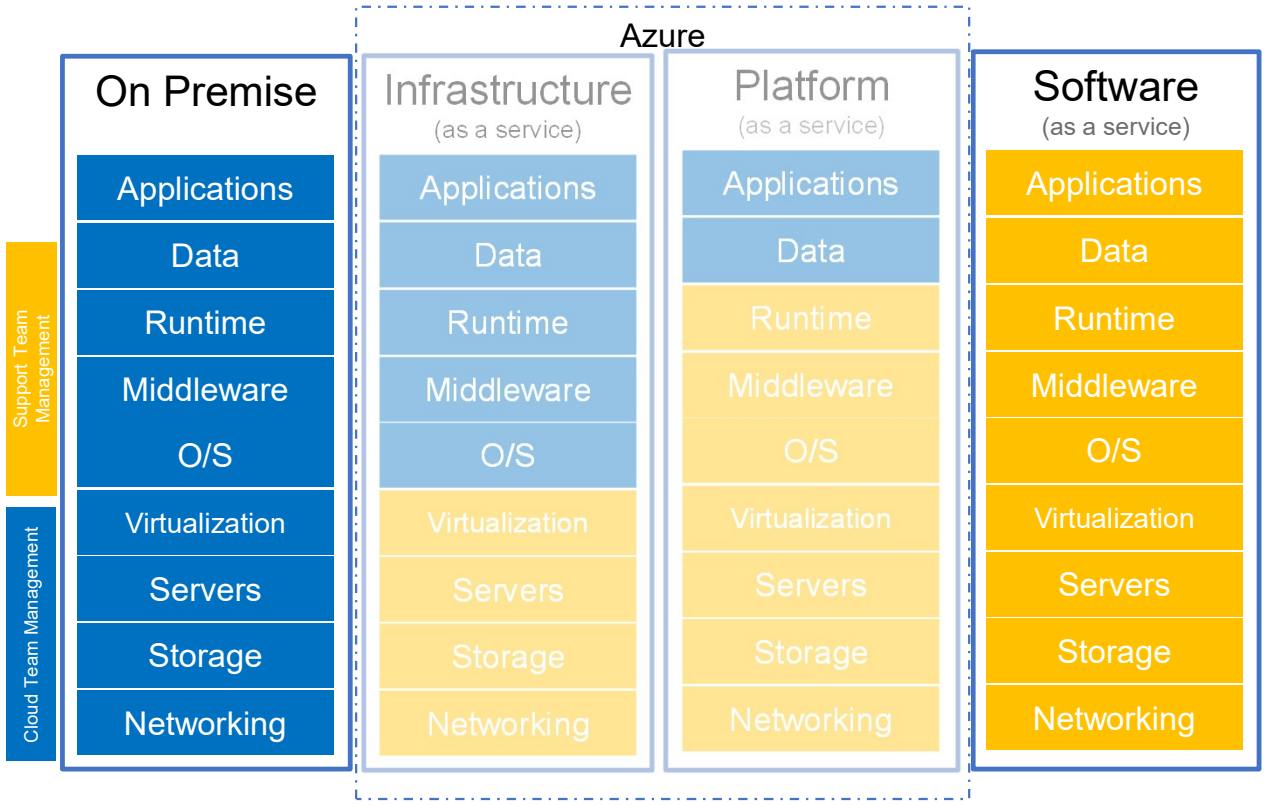


Azure

- Microsoft Azure is a cloud computing platform and infrastructure for building, deploying and managing applications and services through a global network of Microsoft-managed and Microsoft partner hosted datacenters.
- Provides both **PaaS** and **IaaS** services and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems.
- Microsoft Azure helps provide confidentiality, integrity, and availability of customer data. It is designed with the objective that customer data must be secure with an availability of 24x7 and applications must be compliant with security standards for cloud applications



Azure Application Fitment



Decision Matrix can be used for determining the type of service that can be used for an application based on the level of control that the application or organization need along with the company and country legal regulations.

Infrastructure As A Service(IAAS) Cloud consumer has higher control and flexibility at system level but will have higher administration and licensing overheads.

Platform As A Service(PAAS): Lesser control and flexibility in underlining IT configuration but higher flexibility on hosting application and associated data

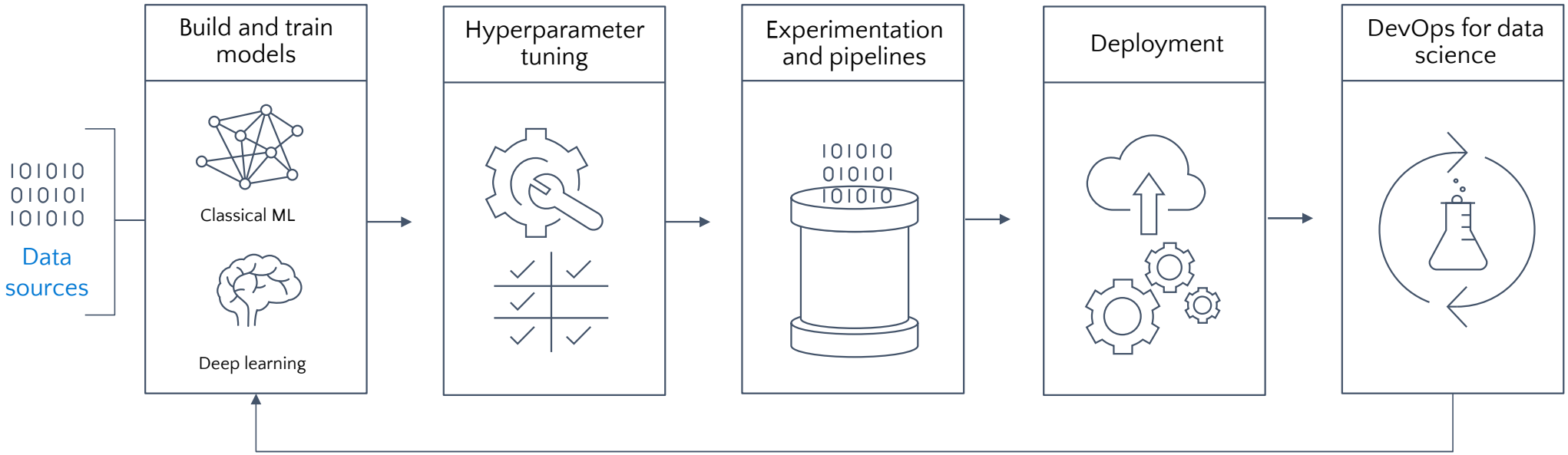
Software As A Service(SAAS): Cloud consumers do not have any control in determining the underlying infrastructure and no operational overheads.

Azure Service Catalogue

Azure Cognitive Skills

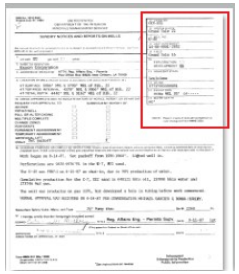
Vision	Speech	Language	Decision
Computer Vision	Speech to Text	Immersive Reader	Anomaly Detector
Custom Vision	Text to Speech	QnA Maker	Content Moderator
Face	Speech Translation	Language Understanding	Metrics Advisor
Video Indexer	Speaker Recognition	Text Analytics	Personaliser
Forms Recogniser		Translator	

Azure ML

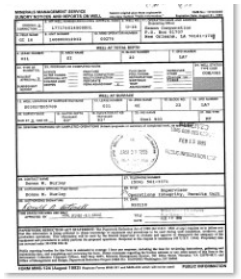

Build and train models
Hyperparameter tuning
Experimentation and pipelines
Deployment
DevOps for data science
101010
010101
101010
Data sources
Classical ML
Deep learning

Use case – Image Classification

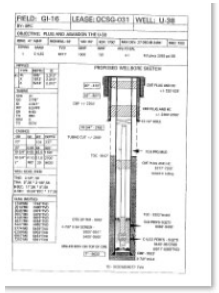
Completion Report



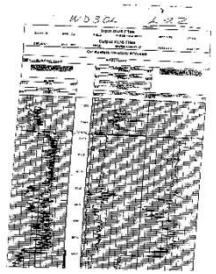
Well Reports



Sundry Notice



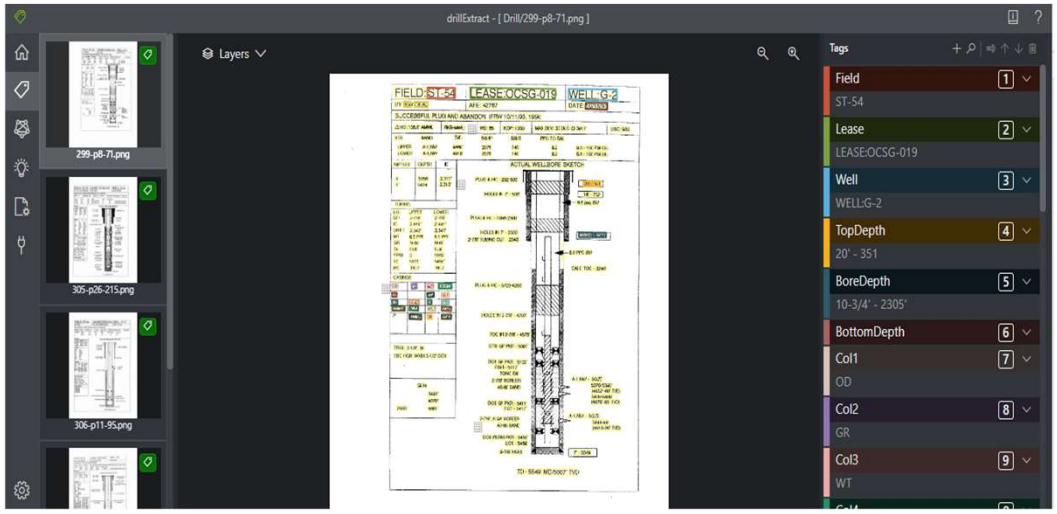
Drill Diagrams



Seismic Sections

- Exploration team have dataset containing PDF files that contain critical drilling information related to a specific region.
- Domain expert have to manually open each file and determine if a specific information exist in the PDF.
- The exercise is practically impossible considering the volume of files present.
- Need an extensible automated approach to extract the information required.

Use case – Form Data Extraction

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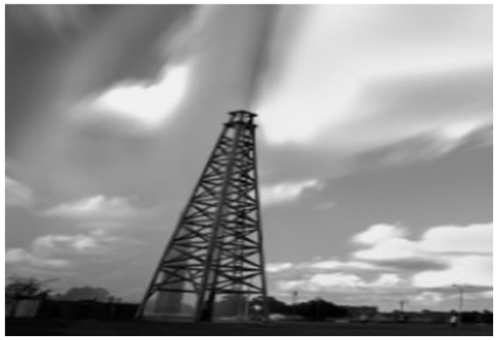
- Exploration team have multiple drill diagrams obtained by the field engineers.
- Drill diagrams are in the form of diagrams and drill information has to be manually extracted to load to database.
- Extracted data is used for analysis and determining operational decisions.
- Need an extensible automation approach to extract data from images.

Use case – Prevent Oil Well BlowOut



- Volume of Oil flow from exploration wells is unpredictable .
- Oil flow out of exploration wells have to carefully controlled and monitored to ensure maximum profit.
- Well blowouts may happen if the oil flow is not controlled leading to environmental contamination and accidental deaths.
- Sensor information from wells have to be monitored for anomalies to take corrective actions .