



Digital, Data Analytics, and Automation: Value Creation Through Digital E&P

19-20 NOVEMBER 2024 | BANGKOK, THAILAND



Key Learnings and Challenges in Implementing Digital Transformation in Medco E&P Indonesia

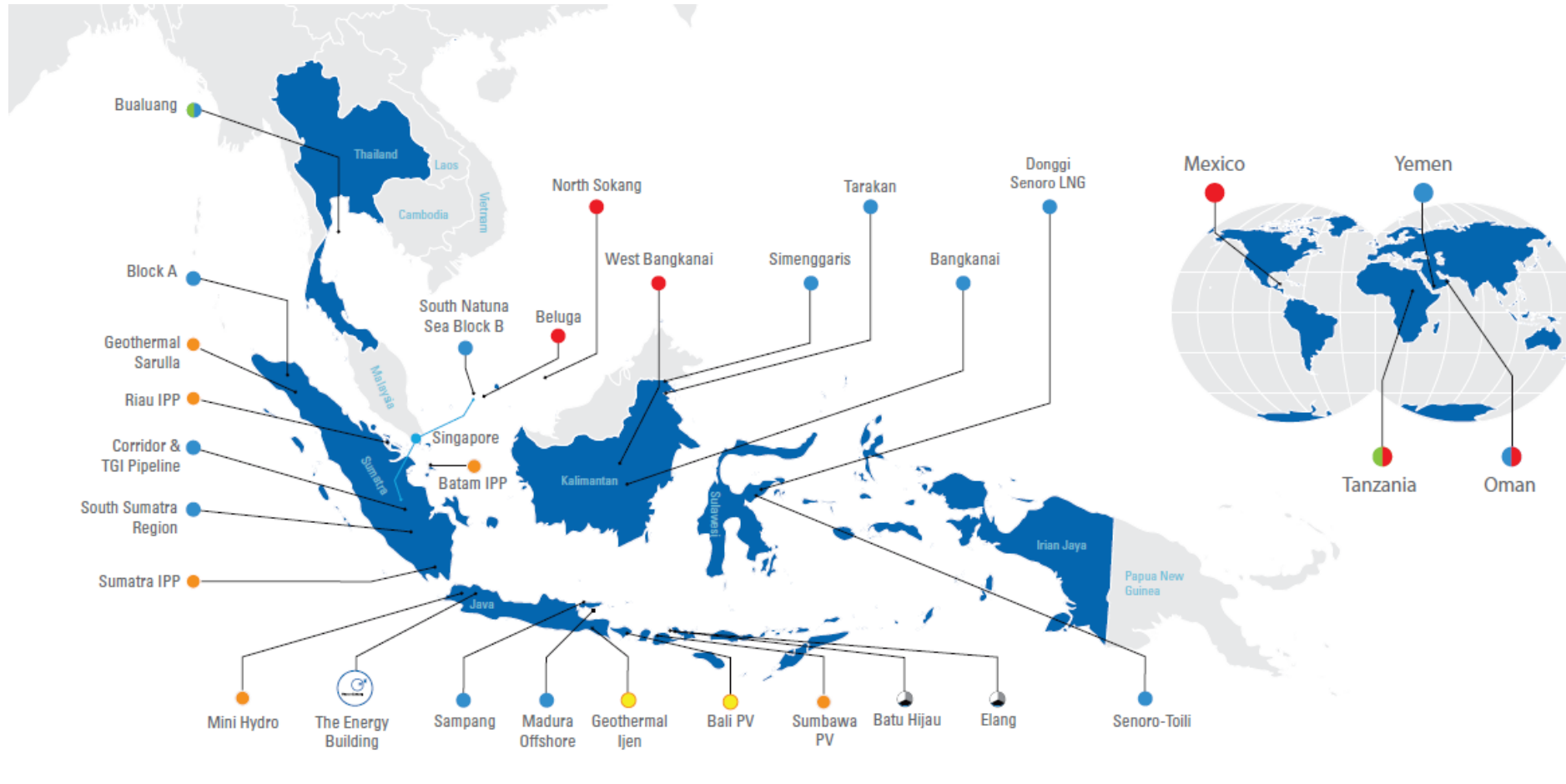
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Medco E&P Indonesia



MedcoEnergi - Portfolio



- Production
- Development
- Exploration



- Power Installed
- Power Development



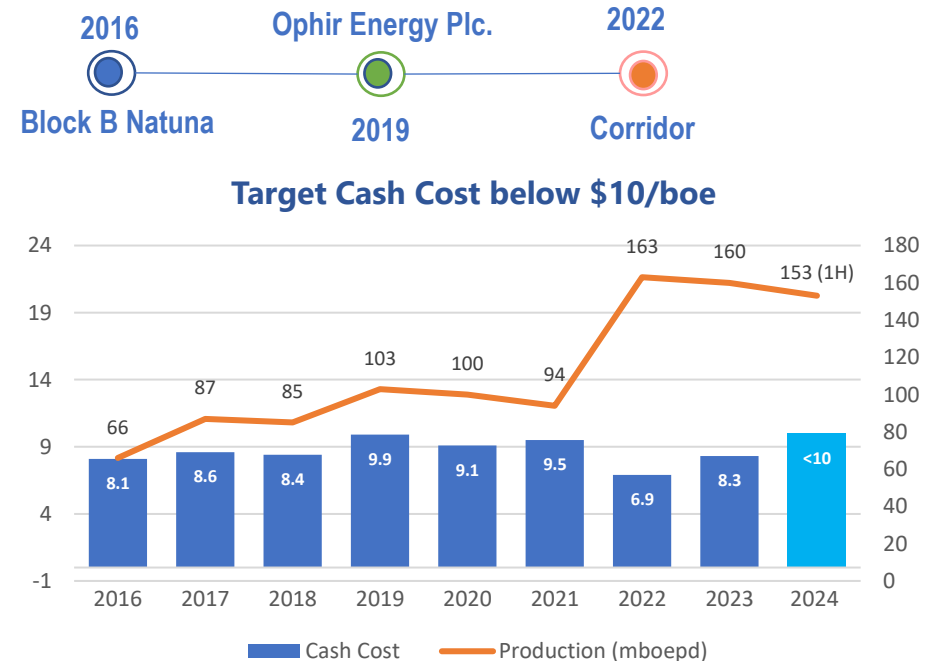
- Mining Production
- Mining Development
- Mining Exploration

Business vs Digital Transformation

Business as “The Driver”

MedcoEnergi’s Strategy :

- Cost and capital efficiency, operational effectiveness
- Optimizing project cycle time with renewed focus upon value and delivery
- Portfolio rationalization to meet return and profitability benchmarks
- Leveraging MedcoEnergi’s strong domestic position through focused acquisitions and contract extensions
- No compromise on safety



Digital Technology & Transformation as “The Enabler”

Digital IT Strategy – The Next 5 Years (2022-2027)

Our Company Strategy

Cost and capital efficiency, operational effectiveness

Optimizing project cycle time with renewed focus upon value and delivery

Portfolio rationalization to meet return and profitability benchmarks

Leveraging MedcoEnergi's strong domestic position through focused acquisitions and contract extensions

No compromise on safety

Digital IT Vision

Deliver value to our business by exploiting digital technologies to make our operations and processes more efficient, effective, intelligent and automated

STRENGTHEN THE DIGITAL FOUNDATION

Improve and deploy application and infrastructure platform through the right investment to enable operation excellence and digital transformation

ESTABLISH DIGITAL OPERATING MODEL

Change the way IT works by aligning structure, processes and governance for the IT Operating model to enable strategic & agile business decisions

IT as a strategic partner of business

Align IT employee skills with new digital technology capabilities and competencies

DRIVE DIGITAL TRANSFORMATION ACROSS OUR BUSINESS

Adopt and deploy digital technologies to deliver operations and business value aligned to business priorities and company strategy

Empower our people with integrated data and analytics by building our data foundation to deliver data insight and predictions in supporting portfolio decisions

CYBERSECURITY

Digital Transformation – Key Learnings and Challenges

Business is the Driver – Digital Technology is the Enabler

Strong business problems to address and clear what to achieve;

Technology offerings (Sensors, AI, ML/DL, RPA, Remote Ops, Drones, Cameras, AR, Dig-Twin, etc) are massive - need to be selective



Start small use case and scale up,
Quick PoC, deploy, learn and scale up

Having the Data Insights is only a first step, what we do with them and how the organization responds to the identified anomalies/alerts are more important

Digital Transformation is a Continuous Journey requiring strong digital foundation

Expect Investment on Strengthening Digital Foundations - Data Management/Infrastructure/Modernize Platform/IT Security

Need to Build Organization Capability and Culture – Knowledge/Skills on Data Science; Culture on Data Driven Decision and Empower people to innovate

Leaders Start Talking about It, Use it for Communication and Decision Making

Value Creation Monitoring is important to justify the spending (RoI) and to confirm that we really solve the pre-defined business problems

Digital Transformation – Use Case on Turbomachinery Maintenance

Business Problems as Drivers:

- Large number of major **turbomachinery** (33 units – GTC and GTG)
- High **reliability** and availability expectation
- **Mature** fields (5 platforms, 1 FPSO, 1 OPF, first installation in 1992)
- Maintenance cost optimization: gas turbine **TBO** extension

Technology as Enabler:

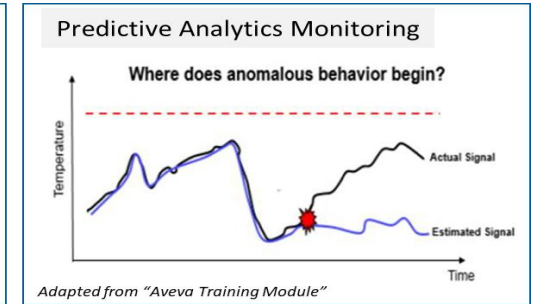
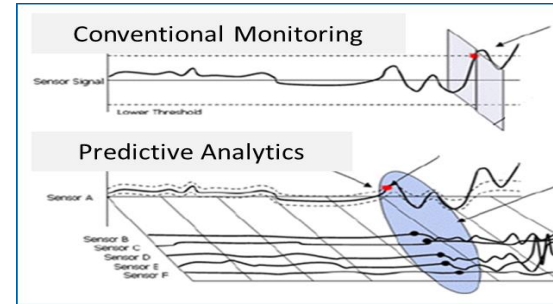
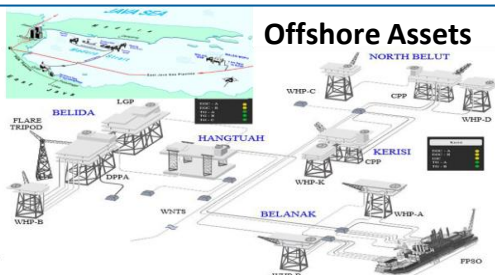
- Shifting from conventional to **predictive** performance monitoring
- Utilize **MPredict Predictive Analytics with Machine Learning** to maintain the high reliability and optimize the maintenance cost

Digital Foundations Challenge:

- Critical equipment with good data connectivity

Method & Analysis:

- Integrate **data historian** systems and the **anomaly detection tool**
- Use historical data to model the normal behavior of a system and builds a collection of **operational profiles**
- Continuously compare current values to **predicted data**
- Engineer validates the finding, communicates the recommendations, to fields, and tracking the closure6DSZ

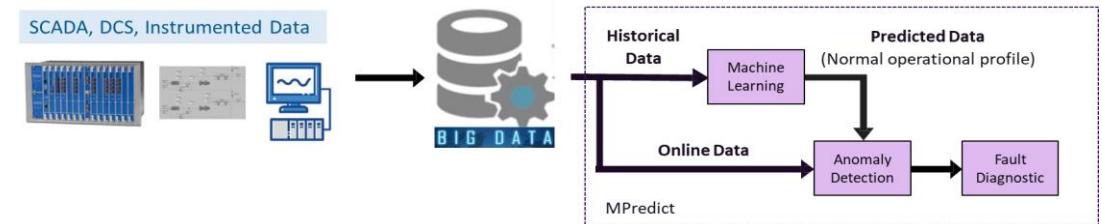


Value Creations:

- Decreased **Unplanned shutdown event** from 45-46 to 24-26/year
- Increased equipment **reliability** from 93-94% to 97-98%
- Reduced **GHG emissions** by reduction of gas blowdown and minimized HSE risk by reducing engine start-stop
- Better **planning** on maintenance utilizing Remaining Useful Life

Value Catch Case - Early Warning Field 2 EGC-B

- Detected a **rapid increase** in the air inlet filter dP from 3.3 to 4.2-inch H2O in 56 hours, **forecasted** to reach HH within 6 days
- The dP is affected by engine inlet & exit temperature, speed, compressor discharge pressure, inlet flare dP
- Found dirty filter due to exhaust smoke contamination, managed to switch over and replaced the filter.



Digital Transformation – Use Case on Citizenship Data Scientist Program

Organization Capability and Culture Building

Citizen Data Scientist:

“a person who **creates or generates machine learning models** that use advanced diagnostic, predictive, and prescriptive capabilities, but whose **primary job function is outside the field of statistics and analytics.**” - Gartner

Why We Do This ? (Starting in 2024)

- **Develop innovative solutions:** By embracing new data analysis techniques and fostering a data-driven culture, we can overcome hurdles and unlock the full potential of our data.
- **Empower our workforce:** Investing in data literacy programs can equip our employees with the skills needed to effectively utilize and analyze data, fostering a collaborative and data-driven environment.
- **Foster Analytic Culture:** build foundation for **evidence-based choices**, replacing guesswork and intuition.

A. Medco Data Science Academy



Foundation
introductory topics

- Introduction to Data Science
- Introduction to Machine Learning
- Introduction to Statistic
- Programming for Data Science (Data Manipulation, Design of Experiment)

Intermediate
diagnostic and predictive

- Data Wrangling & Visualization
- Machine Learning I (i.e., Classification, Clustering, Regression, Change Detection)
- Machine Learning II (i.e., Time Series, Neural Network, Variable Selection)

Advance & Capstone Project

- Advance Use Case (Optimizing, Simulation, Unsupervised Learning)

ANALYTICS FOR BUSINESS LEADERS SEMINAR
The AI Era: Culture, Trends, and Leadership
Thursday, 12 September 2024
08.30 – 10.30 WIB
Microsoft Teams

ANALYTICS FOR BUSINESS LEADERS SEMINAR
STRATEGIC DECISION MAKING WITH ANALYTICS
SEGMENT 1: DECISION MAKING WITH DATA
SEGMENT 2: MACHINE LEARNING IN 60 MINS

Prof. Dr. Ir. Hammam Riza, M.Sc.
President of Indonesia Collaborative AI Association (IDKAI)

Dr. Eng. Ayu Purwarianti, S.T. M.T.
Associate Professor at Bandung Institute of Technology

Venue: Hybrid (Online and Offline) at Senoro, Sumpal, Balide
Date : Friday, 18 October 2024
Time : 13.30-15.30 WIB (2 hours)

B. Data Science For Broader Participants

Analytics for Business Leaders Seminars

Data Analytics & Visualization Essentials Training

Expert coaching by Data Scientist (Industry Professional or Academia)

Key Takeaways – Triggers for Further Discussion



Digital Technology is the **Enabler**; **Business** is the **Driver**.

Tracking Value Creation is **key** to ensure right RoI and solving the Business Drivers.



Digital Technology changing **very fast** – **Adoption** of **Digital Technology** can **NOT** be **one-fit-all** approach – it should adjust to business requirements



Digital Transformation is a **continuous Journey**. You may **start with fixing and uplifting your Digital Foundations** (quality data, data integration, infrastructure)



Having the Data Insights is **only a first step**, **what we do with them** and how the organization responds to them are more important



Start from small use case and scale up



Do not underestimate the need for Organization Capabilities and Culture Building



Human continue doing Human Things – AI will not replace You