



Schlumberger

Cloud-Based Exploration Collaboration Tools for Managing Nation-wide Upstream Oil and Gas Exploration Activities

S. Damayanti¹, S.E. Saputra¹, Andre¹, C. Nurwani¹, F.T. Amir¹, M.Z. Rubianto¹,
T. Wibowo², R. Affandi², F.F. Rahmawati², S. Sitompul², R. Marbun², R. Musa²,
W. Septiningrum²

¹SKK Migas, ²Schlumberger

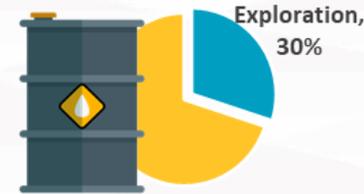
Presented in Digital Forum 2022
September, 20th-22th

INTRODUCTION

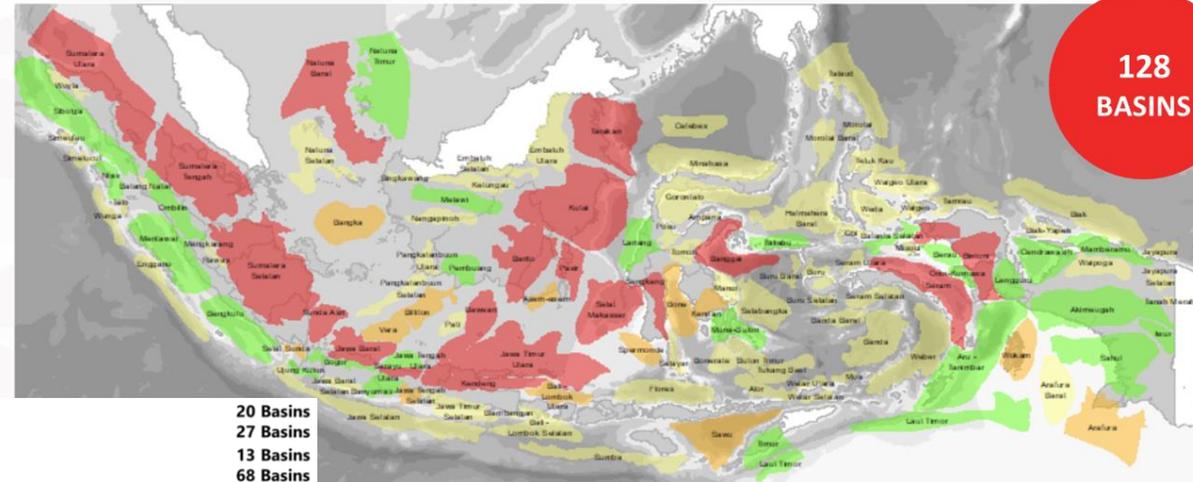
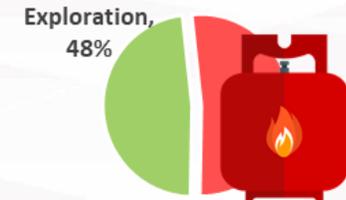
- SKK Migas managed several production basins out of 128 basins across Indonesia, collaborating with more than 100s Oil and Gas Operators.
- Vision of 1 Million BOPD's oil and 12,000 MMSCFD's gas productions in 2030, more than 30% from exploration.
- Strategy to accelerate exploration activity to make the next giant discoveries.
- Need digital solutions to preserve knowledge gathered from Oil and Gas operators' past & present activities, rank prospects, and collaborate with operators to monitor active exploration activities.
 - Using DELFI Explore Plan (and related softwares) as solutions.
 - With pilot project for 3 basins.

2030 Production Target Vision

1 Million BOPD



12 Billion SCFD



PROJECT BACKGROUND & BUSINESS PROCESS

Big Subsurface Data

Including wells, seismics, studies data from active blocks, previous blocks, government's surveys and publications.

Borderless Evaluation

Combining and collaborating exploration results in order to get new broader insight from point of view.

Structured Workflow

A structured workflow from knowledge to evaluation may assist the regional and nation-wide portfolio analytics become possible to be done as a team.

Prospect Ranking

Optimization of exploration asset portfolio, strategy and activity plan to find the new big discoveries.

CHALLENGES & SOLUTIONS

Strict data-residency regulation

Deployed in in-country cloud and data center.

Large volume of digital data

Customized automated data preparation and ingestion workflow to facilitate migration and ease future data management.

Data Centralization

Cloud basis data gather, upload, and editing can be accessed by designated user.

Data security and assurance

Service Organization Controls type 2 (SOC2) accreditation using proven protect-detect-response approach.

Object size limitations

Dedicated storage for seismic data (big size data) management to overcome these limitations.

Direct Portfolio Analytics

Portfolio analytics can be delivered as dashboard, directly from the result of data evaluation.

Exploration workflow

Frame & Plan

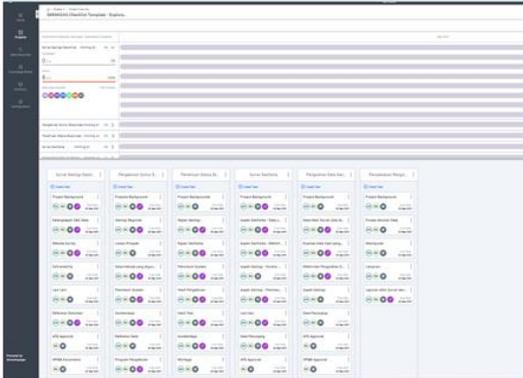
Evaluate

Decide

Cloud-native exploration planning tools

PROJECT PLANNING

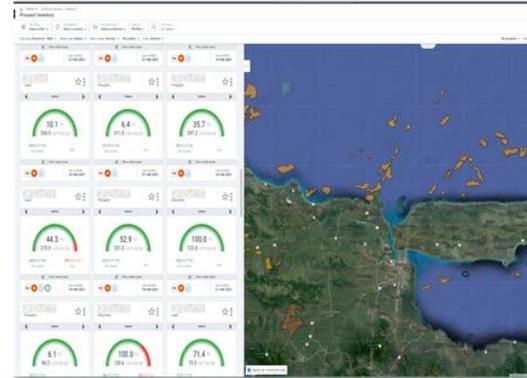
Manage portfolio of exploration projects



Define projects including planning, team, tasks, milestones and deliverables

KNOWLEDGE DASHBOARD & DATA DISCOVERY

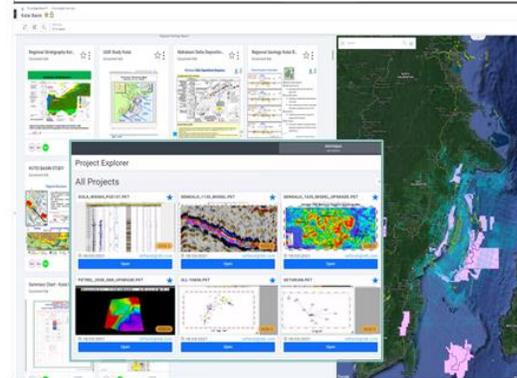
Get instant access to the opportunities inventory



Interactive spatial portfolio view with assessment results (volume, value, risk) & metadata (classification, status)

PETROTECHNICAL EVALUATION & KNOWLEDGE CAPTURE

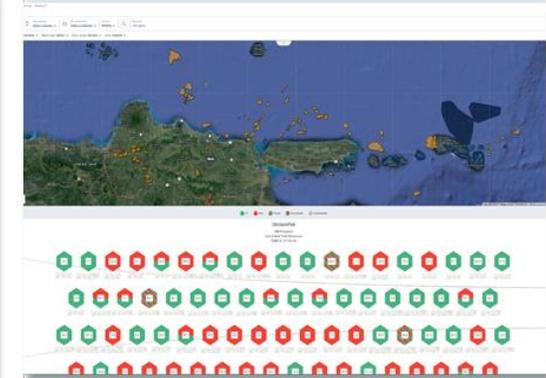
Data evaluation & capture knowledge in an interactive board



Review and create knowledge in geospatial context; Access to data, documents, evaluation software & platform

PORTFOLIO ANALYTICS & DATA DISCOVERY

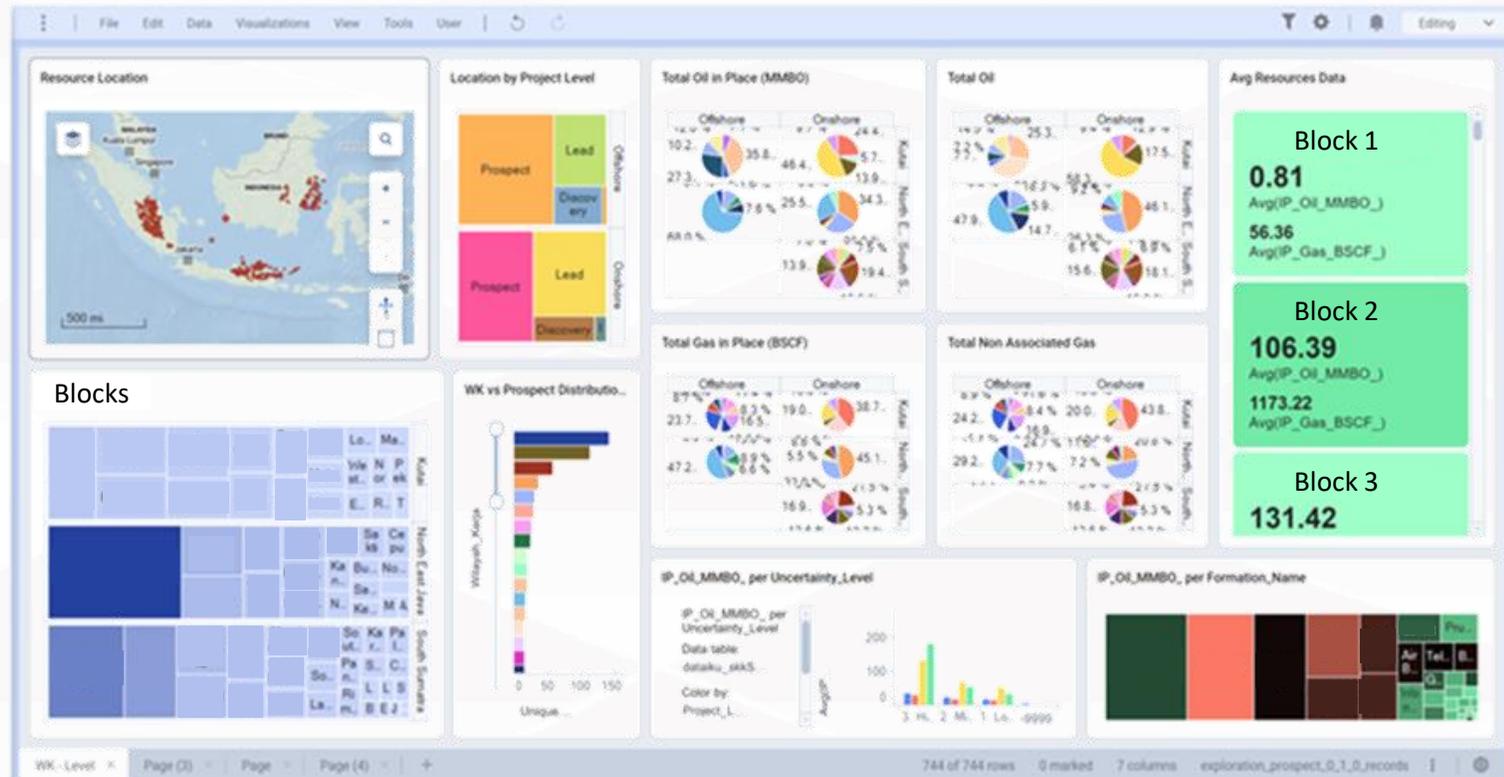
Corporate exploration portfolio funnel & analytics dashboard



Review and analyze the exploration portfolio & decide on actions to address the business need

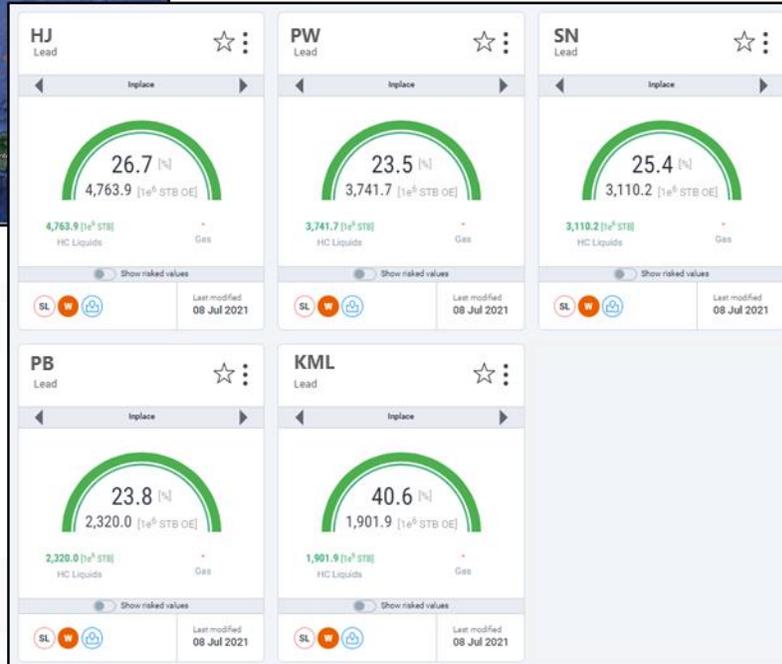
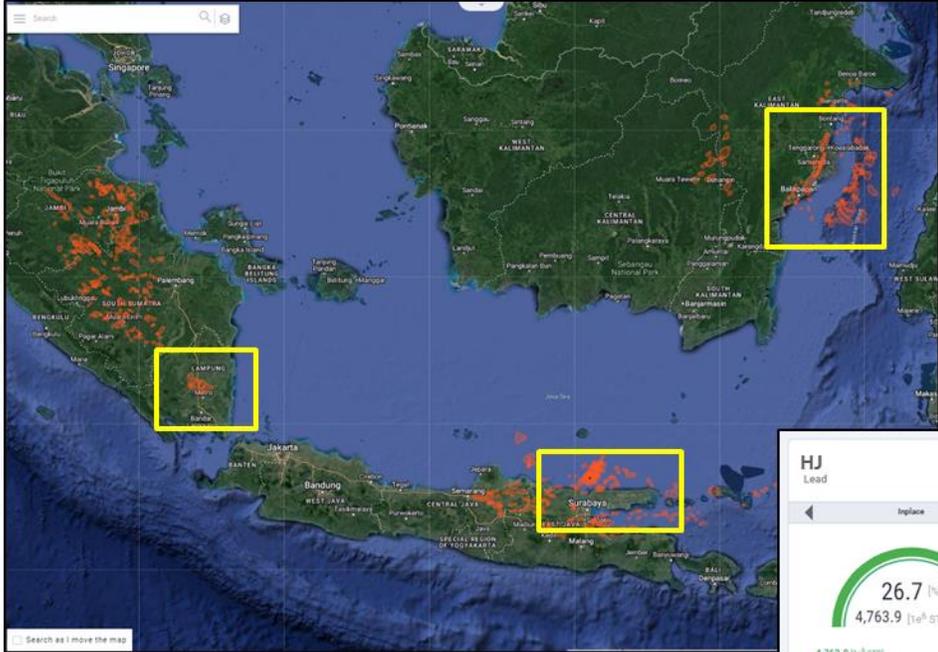
AI-SUPPORTED DATA ANALYTICS

- All data, interpretations, evaluations and risking results are stored in the data ecosystem – available for instantaneous data mining and analytics.
- Enables data visualization to get insights from the entire portfolio.

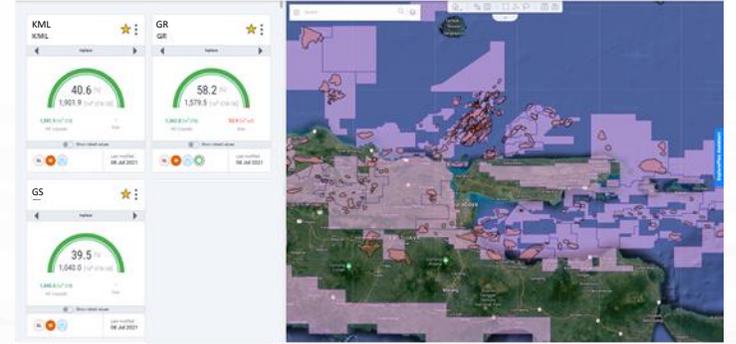


PROSPECT RANKING

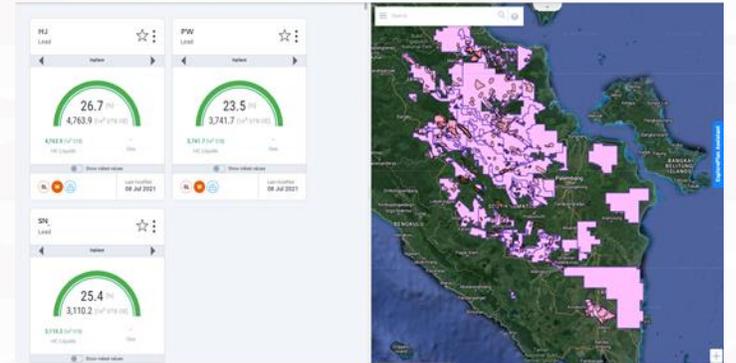
Top 5 P&L in Indonesia from 3 Basins



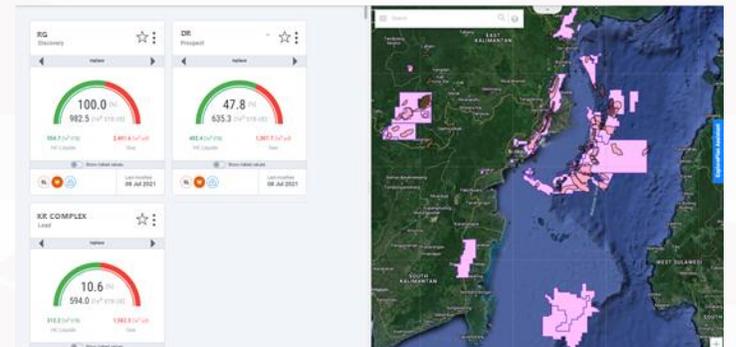
Top 3 P&L in NE Java Basin



Top 3 P&L in SS Basin



Top 3 P&L in Kutai Basin

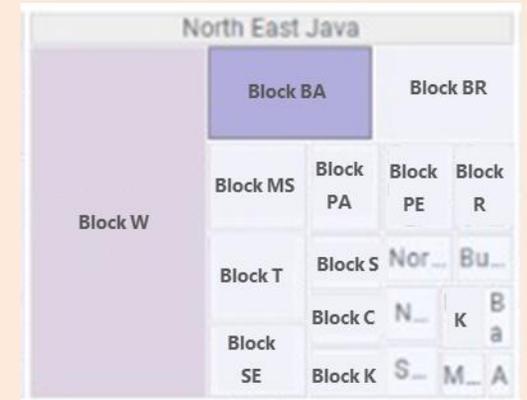
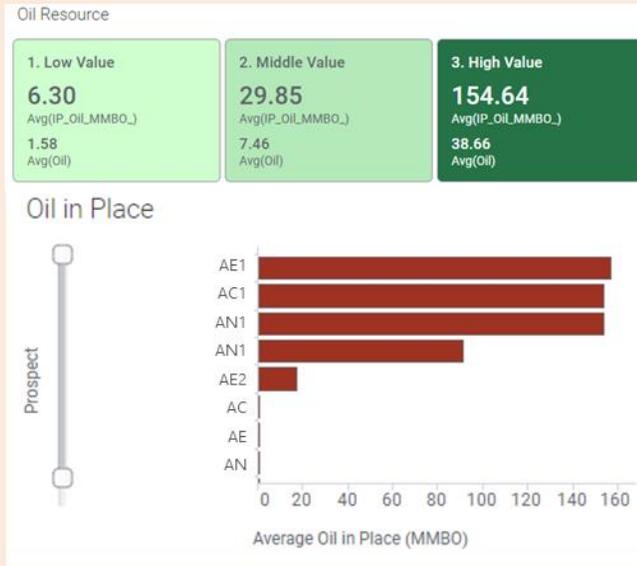
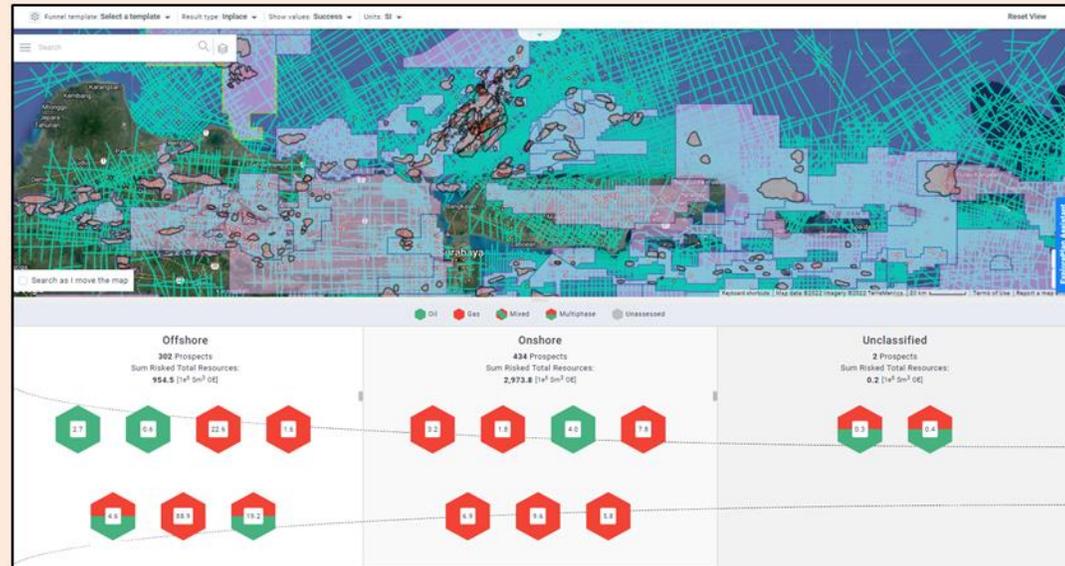
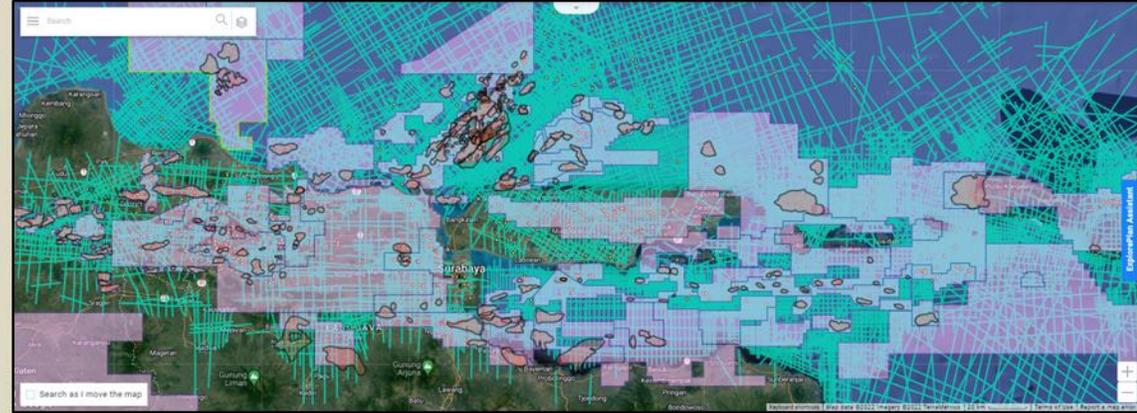


PILOT PROJECT RESULT

Prospect Collection within NE Java Basin

Block BA Indonesia					Block BL Indonesia					Block K Indonesia				
Prospect	Success Mean (1k ³ STB OE)	Risk Mean (1k ³ STB OE)	COG (%)	HC Phase	Prospect	Success Mean (1k ³ STB OE)	Risk Mean (1k ³ STB OE)	COG (%)	HC Phase	Prospect	Success Mean (1k ³ STB OE)	Risk Mean (1k ³ STB OE)	COG (%)	HC Phase
Kotabumi	371.2	259.6	70	Mixed	Tugu	289.1	181.2	53	Oil	West Kang.	193.2	193.2	100	Gas
Kemala	475.5	193.0	41	Oil	Rembang	172.9	107.8	53	Gas	South Celu	127.9	38.0	29	Oil
Gesti	270.6	157.5	58	Mixed	Rembang	101.8	67.8	67	Gas	Segontoh	56.9	19.5	34	Gas
Garano	200.3	79.1	39	Oil	Gondolenan	132.1	53.5	41	Oil	Monono	112.6	7.1	6	Oil
Net Share: 0 (%) Total Risked Volume: 1,022.5 (1k ³ STB OE) Blocks: Brentas Block					Net Share: 0 (%) Total Risked Volume: 696.5 (1k ³ STB OE) Blocks: Blora Block					Net Share: 0 (%) Total Risked Volume: 261.2 (1k ³ STB OE) Blocks: Kangean Blo...				
No license date data available					No license date data available					No license date data available				
Modified: 02 Mar 2021					Modified: 02 Mar 2021					Modified: 13 Feb 2021				

Existing Prospect, Wells and Seismic Location in NE Java Basin



PILOT PROJECT RESULT

Top Prospect in NE Java Basin

Prospect	Resource Potential >		Intermediate >		Analysis >
	Chance ...	Recover...	Gross rock volum...	Net rock volu...	Analysis na...
<input type="checkbox"/> KML	41%	475.5			Lead
<input type="checkbox"/> GR	58%	270.6			Lead
<input type="checkbox"/> R	38%	143.6			Prospect
<input type="checkbox"/> 1	40%	89.1			Prospect
<input type="checkbox"/> 2	37%	69.1			Lead
<input type="checkbox"/> 3	100%	57.9			Discovery
<input type="checkbox"/> 4	17%	20.2			Lead
<input type="checkbox"/> 5	78%	17.9			Lead
<input type="checkbox"/> 6	25%	23.4			Lead
<input type="checkbox"/> 7	9%	13.5			Lead

KML

Lead
Working
Created by Ridho Affandi on 26 Feb 2021
Last modified by slbingexplor on 08 Jul 2021

Prospect Overview | Prospect Risks & Volumes | Segment Overview | Segment Risks & Volumes

Summary
No summary available

Recoverable

40.6 [%]
475.5 [1e⁶ STB OE]

475.5 [1e⁶ STB] HC Liquids Gas

Prospect Properties

Prospect ID: 1085
Prospect Analysis ID: 1086
Hydrocarbon Phase: Oil
Project Level: Lead
Location: Onshore

Prospect Overview | **Prospect Risks & Volumes** | Segment Overview | Segment Risks & Volumes

Risk Summary

Chance of Success: 40.6%

Prospect phase summary

Oil	100.00 %
Gas	0.00 %
Oil and Gas	0.00 %

Segment: Highest Risk

KML Reservoir 62%

Risk Dependency Level

Low	36%	High	38%
		41%	COS

Volumes

Inplace Success

Total Resources [1e⁶ STB OE]

HC Liquids [1e⁶ STB]

HC Liquids: 0, 928, 1,200, 1,400

Oil: 0, 1,901.9, 1,901.9

Condensate: 0.0

Gas [1e⁹ scf]

Gas: 0, 0, 0, 0

Non. Assoc. Gas: 0.0

Assoc. Gas: 0.0

Prospect Overview | Prospect Risks & Volumes | **Segment Overview**

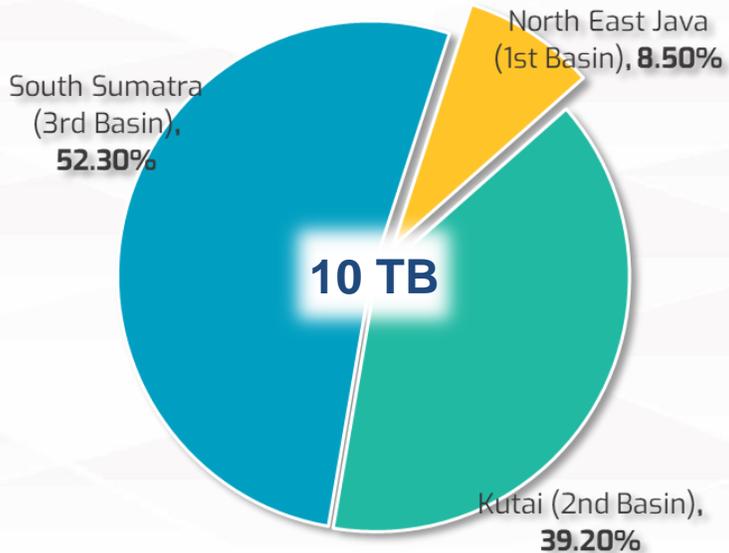
NE Java Basin

- Kujung Reservoir
- Kujung Carbonate
- Miocene Age
- KML

Risks

KML	
Trap	75%
Reservoir	62%
Migration	97%
Source	85%

PROJECT TIME COMPARISON



Previous Projects

- **1 Basin** with the biggest data availability
- **Redundant workflow** of collecting and integrating data.
- Need further effort to combine several projects in order to get nation-wide portfolio.



1 Year

ExplorePlan Project

- **3 Basins** with the biggest data availability
- **One time process** for collecting and integrating data (continuous data update) in Data Ecosystem.
- Integration of several projects can be done seamlessly.



~220 days

CONCLUSIONS

- The quest for substantially increased oil and gas production inspired the need to search for a cloud-based digital solution to assess and manage Indonesia's data and exploration portfolio of 128 basins in the future.
- Key digital tools as part of this solution that have been used to solve the challenges are project planning, knowledge dashboard and portfolio analytics.
- Data and knowledge related to all basins and prospects in Indonesia are captured and stored in cloud-based storage.
- Users can easily access and rank prospects and fields in Indonesia anytime from any location using the cloud-based platform.
- The embedded data AI-supported analytics workspace provides insights into the entire portfolio thus enabling informed portfolio decisions with a complete audit trail.
- **Challenges:** Enhance the technical evaluation with newest data and play concept.
- **Opportunity:**
 - Cloud access allows digital collaboration between SKK Migas and operators and eases the supervision of projects to enable reliable reporting of resources and reserves.
 - Possibility to have data room with investor for the result of regional analysis.

ACKNOWLEDGEMENTS/THANK YOU/ QUESTIONS

Authors would like to express our gratitude to the Energy and Mineral Resources (EMR) Ministry of Indonesia, National Data Center (PUSDATIN ESDM), SKK Migas and Schlumberger management for the support of this paper and the permission to publish it.

S. Damayanti¹, S.E. Saputra¹, Andre¹, C. Nurwani¹, F.T. Amir¹, M.Z. Rubianto¹, T. Wibowo², R. Affandi², F.F. Rahmawati², S. Sitompul², R. Marbun², R. Musa², W. Septiningrum²

¹SKK Migas, ²Schlumberger