GEOHELDA

NIGERIA | CANADA | INDIA

Powering a Digital Future

Oil & Gas Existing Portfolio

COMMITED ORGANIZATION FOR ENERGY CLIENTS

GEOHELDA
Powering a Digital Future

NIGERIA | CANADA | INDIA

Local & International technical personnel

Principals with average of 20+ years in select Industry verticals

Project and risk management methodologies

Quality service delivery focused

Industry specialists in designing and developing next-generation digital platforms

Head office in Nigeria, Project offices in Canada & India

OIL & GAS - PROJECTS

Production and Facility Engineering

Designed Production Optimization Models, Tuned Models (Production Allocation, Target Monitoring), Tuned Integrated Models (Optimum Choke Setting, Optimum Separator Parameters)

Asset Evaluation Reports

Designed an integrated asset development framework covering Reservoir Performance Model, Economic Model and Forecast & Development Model

3D Seismic Data Re-Processing

Project involved 2D seismic PSTM and AVO test processing, Inversion studies, Field Development Studies, seismic PSTM reprocessing

Water Injection Study

Prediction of oil production by water flooding, Petrophysical analyses on 28 wells, wireline logs and core data analysis, geo-cellular model using object modeling with production history reconciliation

AVO & Seismic Inversion for Reserves Delineation

Project involved provision of amplitude versus offset (AVO) study to delineate possible areas of gas accumulation along with Inversion study with Seismic Sculpting to produce 3D Facies

Brown Field Production Enhancements

Brown field production enhancement deploying techniques that optimize well performance and production levels
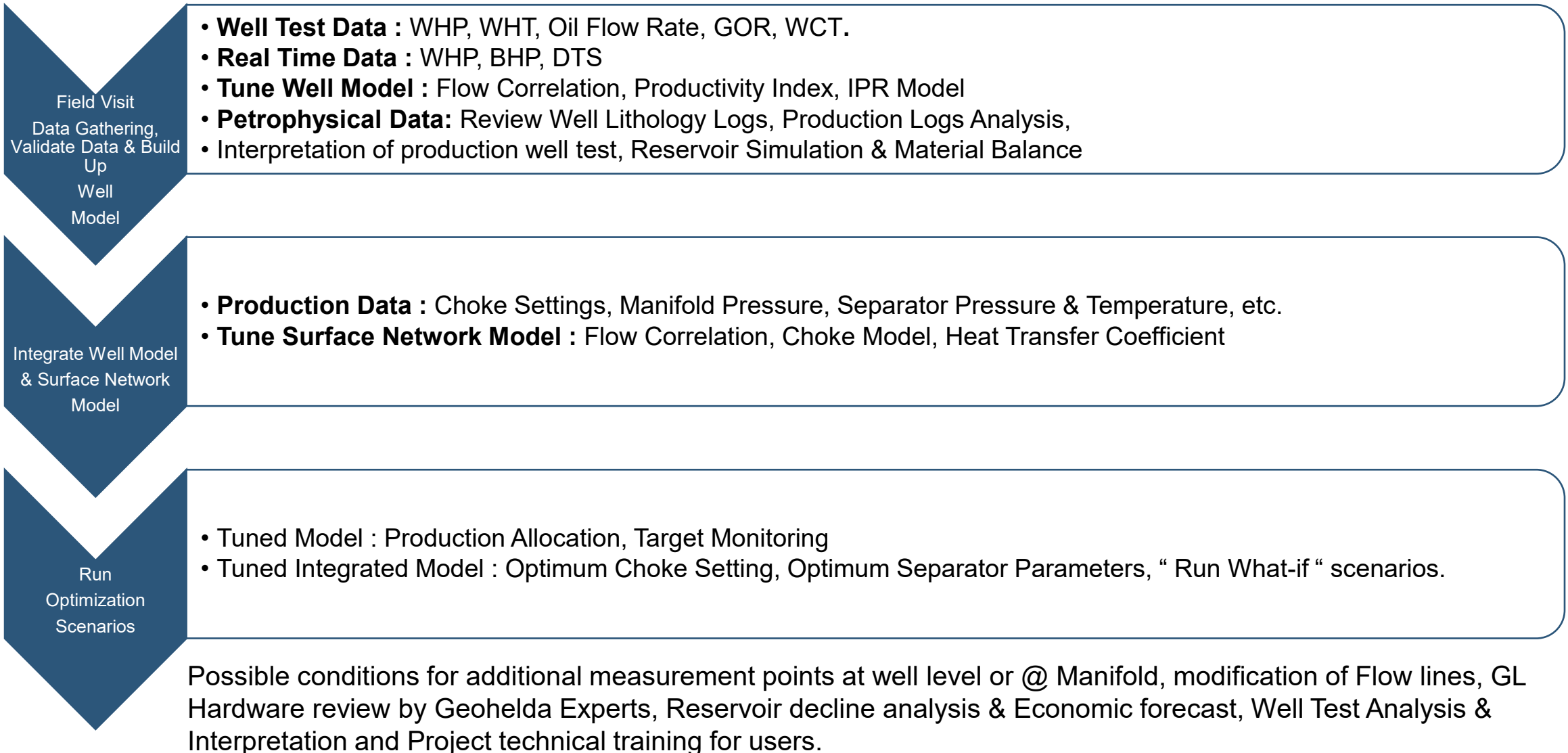
OIL & GAS - PROJECTS

- ✓ Hosted In-House/Cloud
- ✓ Role-based security & Workflow
- ✓ Auditing & Notifications
- ✓ Oracle database storage
- ✓ Hierarchical allocation of production, export, sales streams & consumed streams
- ✓ Supports 3rd Party Allocation tools
- ✓ Integrated into Nigerian Govt/DPR report templates
- ✓ Local support
- ✓ Standard ticket escalation system

OIL & GAS - <u>PROJECTS</u>

Field Visit
Data Gathering, Validate Data & Build Up
Well Model

- **Well Test Data :** WHP, WHT, Oil Flow Rate, GOR, WCT.
- **Real Time Data :** WHP, BHP, DTS
- **Tune Well Model :** Flow Correlation, Productivity Index, IPR Model
- **Petrophysical Data:** Review Well Lithology Logs, Production Logs Analysis,
- Interpretation of production well test, Reservoir Simulation & Material Balance

Integrate Well Model & Surface Network Model

- **Production Data :** Choke Settings, Manifold Pressure, Separator Pressure & Temperature, etc.
- **Tune Surface Network Model :** Flow Correlation, Choke Model, Heat Transfer Coefficient

Run Optimization Scenarios

- Tuned Model : Production Allocation, Target Monitoring
- Tuned Integrated Model : Optimum Choke Setting, Optimum Separator Parameters, " Run What-if " scenarios.

Possible conditions for additional measurement points at well level or @ Manifold, modification of Flow lines, GL Hardware review by Geohelda Experts, Reservoir decline analysis & Economic forecast, Well Test Analysis & Interpretation and Project technical training for users.

OIL & GAS - <u>PROJECTS</u>

<u>Water Injection Study</u>

<u>Prediction of oil production by water flooding</u>

- ✓ Petrophysical analyses on 28 wells, wireline logs and
- ✓ core data analysis
- ✓ Geocellular model using object modeling
- ✓ Production history matched
- ✓ Additional six water and gas injection cases.
- ✓ Multi-disciplinary study geophysicists, Petro physicists, geologists, and reservoir engineers
- ✓ Duration of study – 9 months
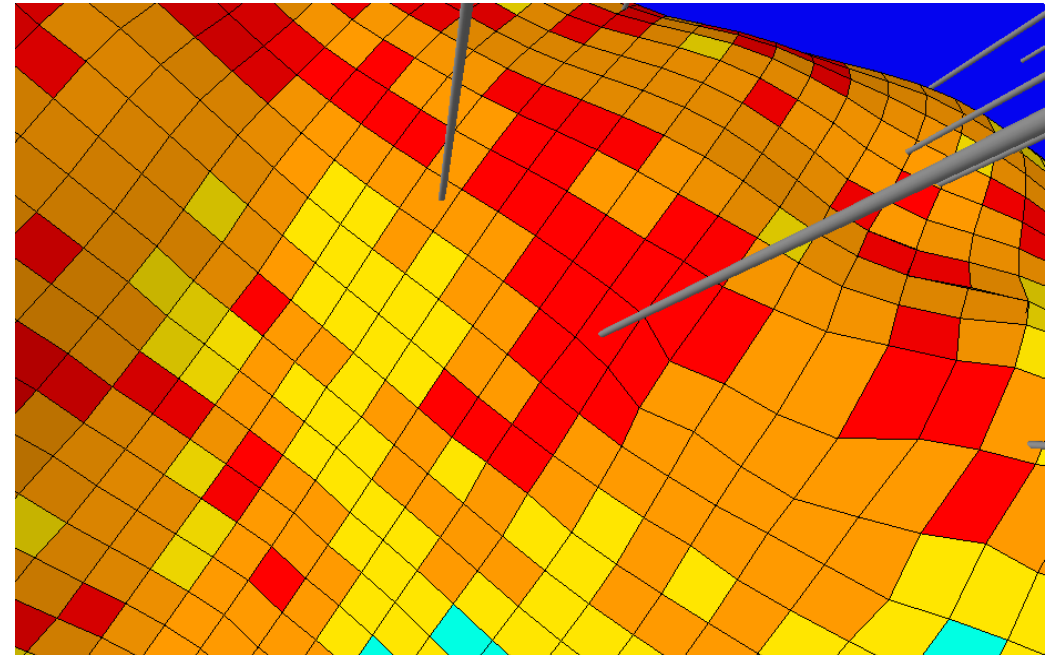
OIL & GAS - <u>PROJECTS</u>

Aim: Propose options to optimize the existing facility from 30,000bbl/d to a production capacity of 60,000bbl/d of fluid

Existing Facility (flow station consists of 2 trains)
- ✓ 1 x LP Separator (2 phase)
- ✓ 1 x HP Separator (2 phase)
- ✓ 1 x surge vessel (2 phase)
- ✓ Test Separator & a XHP separator
- ✓ HP, LP, Test & XHP Manifold

Proposals: Optimization scenarios

- ✓ Water will be separated in a 3rd party facility
- ✓ Water will be separated at the HP separation stage
- ✓ Water will be separated at the LP separation stage

Scenario one was selected and implemented

OIL & GAS - PROECTS

Aim: Propose solutions to optimize production

Challenges
- Ruptured 16" pipeline to manifold
- Sand and scale deposition
- Improper separation of oil, gas and water
- Inability to conduct MER and other well tests
- Back pressure to other wells
- Inaccurate crude oil accounting and allocation

Proposal
- Well workover
- Chemical injection management
- Revamp of test separator
- Maintenance of ruptured pipeline, gas compression system and prover loop metering system
- Replacement of faulty valves, transmitters, detectors, chokes and positioners

OIL & GAS - <u>PROJECTS</u>

<u>Liquid Carryover – Gas Separation Study</u>
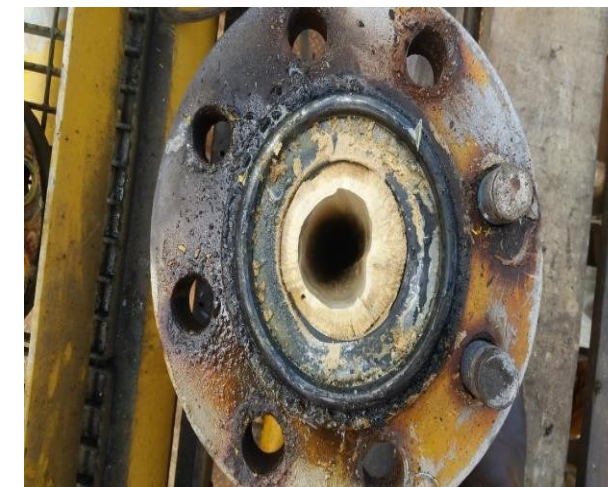
Aim: To improve the environmental quality of flare combustion products discharged into the atmosphere.

Challenges:
- Intermittent liquid carryover into the flare network
- Sooty flames appearing intermittently when flaring excess gas from the flow station

Methodology: Facility Process Simulation
- Steady-state model
- Dynamic model
- Model Tuning and Sensitivity Analysis
- Simulation of possible gas separation upsets in separators
- Reporting

Solutions: Replacement of the following:
- Level control transmitter due to output signal error
- Liquid level control valve due to sticking effect
- Mist extractor
- Backpressure controller due to signal error

OIL & GAS - <u>PROJECTS</u>

AVO & Seismic Inversion for Reserves Delineation

Challenges
- Determination of Lithology in a complex channel reservoir
- Hydrocarbon fluid type determination in gas/condensate field
- Good VSP but missing density log

Solutions by Geohelda
- Provision of amplitude versus offset (AVO) study for 4 weeks helps to delineate possible areas of gas accumulation.
- Inversion study was combined with Seismic Sculpting to produce 3D
- Facies Model
- Proprietary sequence stratigraphy solution

Field with 22 wells – 18 with log data
- Project took 4 months
- Static model at 90% accuracy (depth and lithology) predictions while drilling
- Successful gas field development
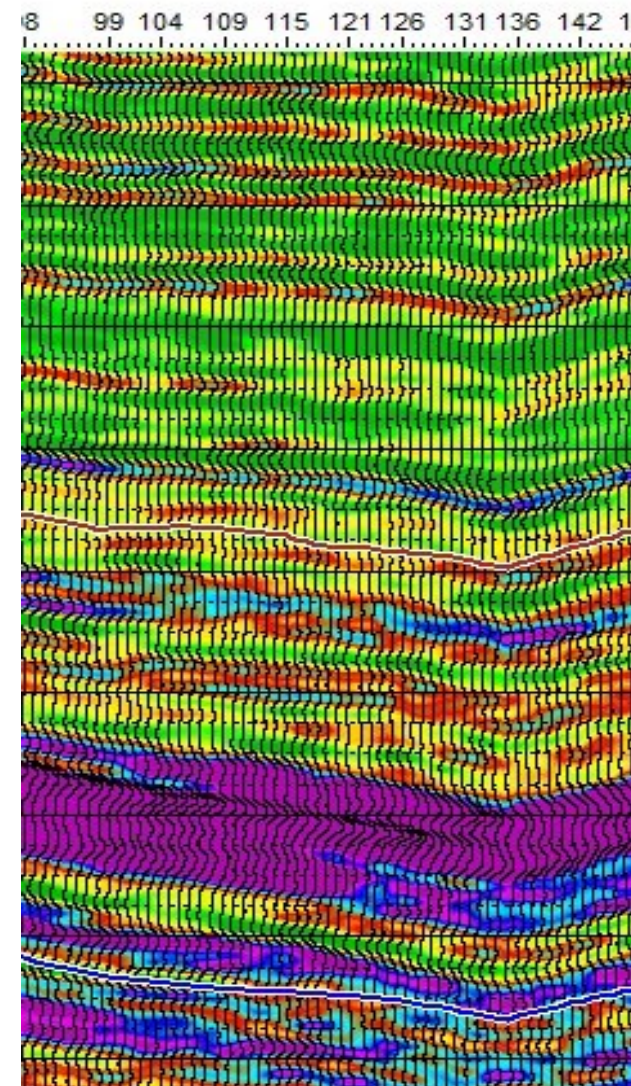
OIL & GAS - <u>SERVICES</u>

Reservoir Evaluation Services

- Asset Characterization & Valuation Studies
- Field Development Studies
- Well Intervention

Production and Facility Engineering

- Measurement, Metering and Fluid Control
- Hydrocarbon Accounting and Back Allocation
- Process Automation and Control
- Production Optimization

Investment/ Divestment Consulting

- Economic Evaluation

IT Services

- Support, Data Mgmt & Application Development
- Seismic Data Processing
- Audit and Pre-qualification Services
- Training and Manpower Development

OIL & GAS - <u>SOLUTIONS</u>

Upstream Data Analyzer

✓Solution certified in SAP HANA which helps in instant visualization as well as predictive analysis of logs from Oil & Gas upstream operations

✓Uses prediction models for sub-surface characteristics, drilling plans, production

✓Supports application of AI/ML algorithms for NPT (Non-Productive Time) reduction strategies

Drilling Operations Network

✓Solution addresses the need for real-time dashboards for drilling consoles for mud, pump, drill assembly, well integrity and pit/tank monitoring

✓Allows real-time, micro-batch as well batch wise visualization as well as analytics - from a time + depth perspective

✓Manages multiple monitoring dashboards - visibility to drilling parameters, such as mud properties, pump and casing pressure, tank volumes, etc.

E&P Data Manager

✓Solution significantly reduces the TAT (Turn Around Time) for E&P data transformations jobs and enable Process Automation in E&P data management domain

✓Adapters built in for SEGY, LAS, WITS, WITSML, PRODML, RESQML, etc.

✓Automation Scripts for Routine tasks like Splicing, Merging, Data Transformation

✓E&P Logs Visualization extensions for Enterprise Reporting Tools

OIL & GAS - <u>FOCUS AREAS</u>

Seismic Data Management

→ Seismic Scanned Images to SEG-Y
→ EBCDIC Header Standardization (2D, 3D & VSP)
→ Facies Prediction/ Classification
→ AI/ML models to identify feature classes - Salt, Seismic Inversion

Well Logs Digitization

→ Well Logs Digitization
→ Well Logs Splicing and Merging
→ Well Logs Correlation
→ Lithology Prediction/Facies Classification

Real-Time Drilling

→ Drilling Consoles for Well Integrity
→ Auto Identification of Drilling Process
→ Drilling Efficiencies for NPT
→ Stuck Pipe, Drill Bit Prediction

OIL & GAS - <u>FOCUS AREAS</u>

Production Monitoring

→ Crude Oil Production Forecasting
→ Crude Oil Production Audits
→ Decline Curve Analysis
→ Production Optimization (Flow Rate Forecasting)

Reservoir Modelling

→ Gas Lift Optimization (Artificial Lift Selection)
→ Reservoir Production & Recovery Factor Analysis
→ EOR Analytics

Pipeline Analytics

→ PODS 7.X Migration
→ PODS Data Management
→ Pipeline 360 - PODS Analytics
→ Pipeline Integrity Analytics (using Deep Learning)

KEY OIL & GAS CLIENTS

KEY BUSINESS PARTNERS

Oil & Gas Upcoming Portfolio

KEY UPCOMING PROJECTS

NUPRC

- PPDM 3.9 Data Warehouse Design and Deployment
- Operator Submission Workflow System for E&P Data Controls
- NPMS Enhancements
- Data Management Support Services
- Analyst Reporting Platform & Services

NMDPRA

- Brown Fields Production Optimization
- Smart Gas Retail Stations
- Safety - PODS Analytics, Pipeline Integrity Analytics

Other Initiatives

- Gas Flaring Assessment and Analytics
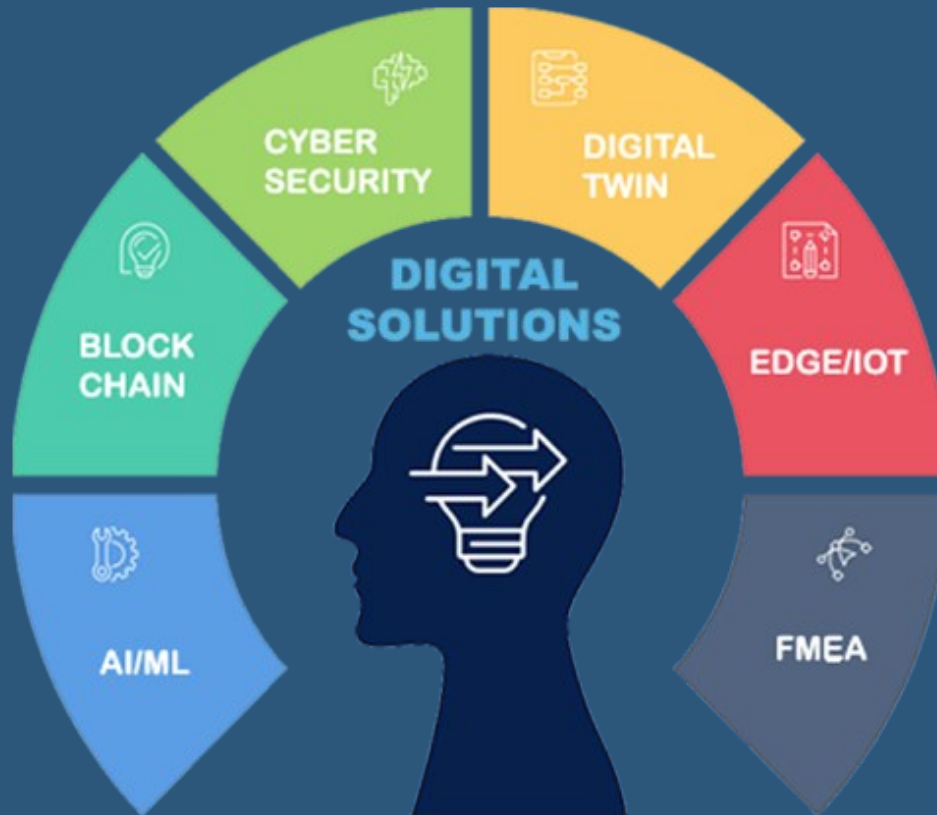- Safety - Oil Spill Analytics
- Sustainability - Emission Analytics
- AI COE - Design and Maintain for the Regulators

Digital Portfolio

PARTNER FOR NEXT GEN DIGITAL ENTERPRISES

Digital Transformation Strategy

Platform Architecture and Analysis

Industrial AI Center of Excellence (CoEs)

Technical Solution Design and Development

Service Experience Design to Deploy

Business Process Reengineering

GEOHELDA EXPERTISE

Oil & Gas

- Expertise in E&P data analytics, production analytics, hydrocarbon accounting, pipeline & refinery plants

- Involved in extended R&D works, application support & project management areas

- Handled projects in process automation, analytics & augmentation services

Renewables

- Expertise in EV BMS analysis, charging stations, grid data management, battery storage & CO_2 capture

- Managed projects in the areas of production forecasting, asset failure prediction & FMEA

- Handled projects in leak detection, GHG emission, ESG reporting

Healthcare

- Expertise in EMR analytics, operational dashboards, fraud analytics & genomics

- Managed Build, Operate & Transfer (BOT) models for healthcare analytics programs

- Handled projects in deep learning on medical images, clinical trails & fraud in insurance claims

Finance

- Expertise in financial risks, smart contracts, contracts analytics & financial forecasting

- Setup COEs for managing shared services in F&A

- Handled projects in robo-advisory services, blockchain, credit lending & risk management services

IT SERVICES

Advisory Support

→ Enterprise Automation

→ Business Value Assessment

→ Application Portfolio Rationalization

→ Infrastructure Design and Recommendations

→ Process Assessment for Automation and Analytics opportunities

Digital Transformation

→ Transformation Strategy

→ Platform Architecture and Analysis

→ Center of Excellence (CoEs)

→ Digital Solution Design & Development

→ Service Experience Design to Deploy

→ Business Process Reengineering

IT Implementation

→ Project Management

→ Design, Build and Test Services

→ Application Setup

→ Go-Live Support

→ Deployment Services

Application Maintenance

→ Maintenance Support

→ Change Management

→ Incident, Problem Management

→ Continuous Performance Improvement

→ Upgrades for Optimization and Performance

IT SERVICES

Technology CoEs

→ Setup Technology COEs for technology acceptance

→ BOT (Build, Operate and Transfer) Model for R&D

→ IP Development and Transfer for Commercialization

→ Design and Develop POCs/Prototypes

E-Commerce/M-Commerce

→ E/M Commerce Portals & Apps

→ Social Media Management

→ Interactive Product Catalogue

→ E-Procurement

Training

→ Enterprise Analytics

→ Industry Specific Solutions

→ E-Commerce

→ Emerging Technologies

BPO/KPO Services

→ Procure to Pay (P2P)

→ Order to Cash (O2C)

→ Record to Report (R2R)

→ Credit Lending

→ Mortgage Processing

→ Risk Management

IT PROJECTS DELIVERY APPROACH

Automation Platforms

CI/CD* Pipelines

Distributed Agile

Solution Accelerators

Design Led Frameworks

Low/No Code Platforms

Reduce Time-to-Market

Optimize Development Cost

Maximize Production Quality
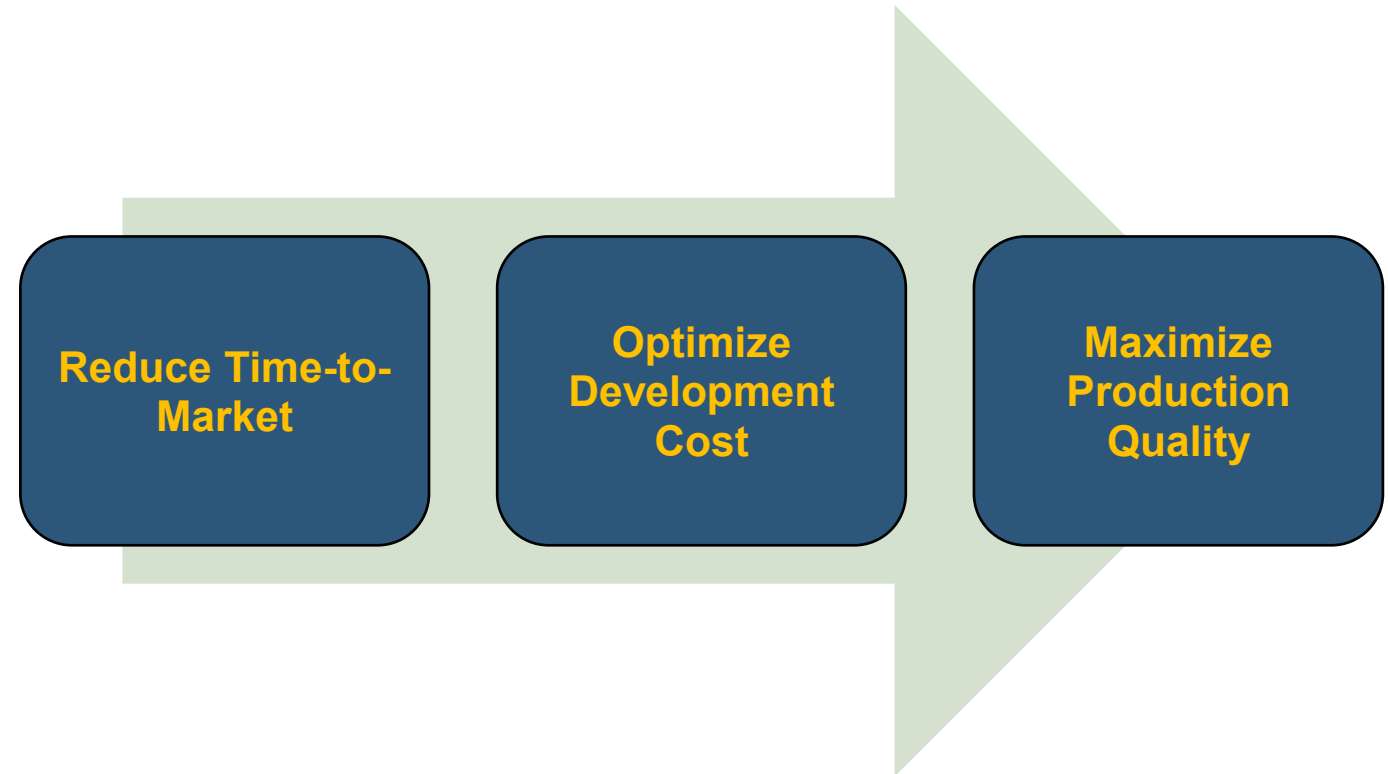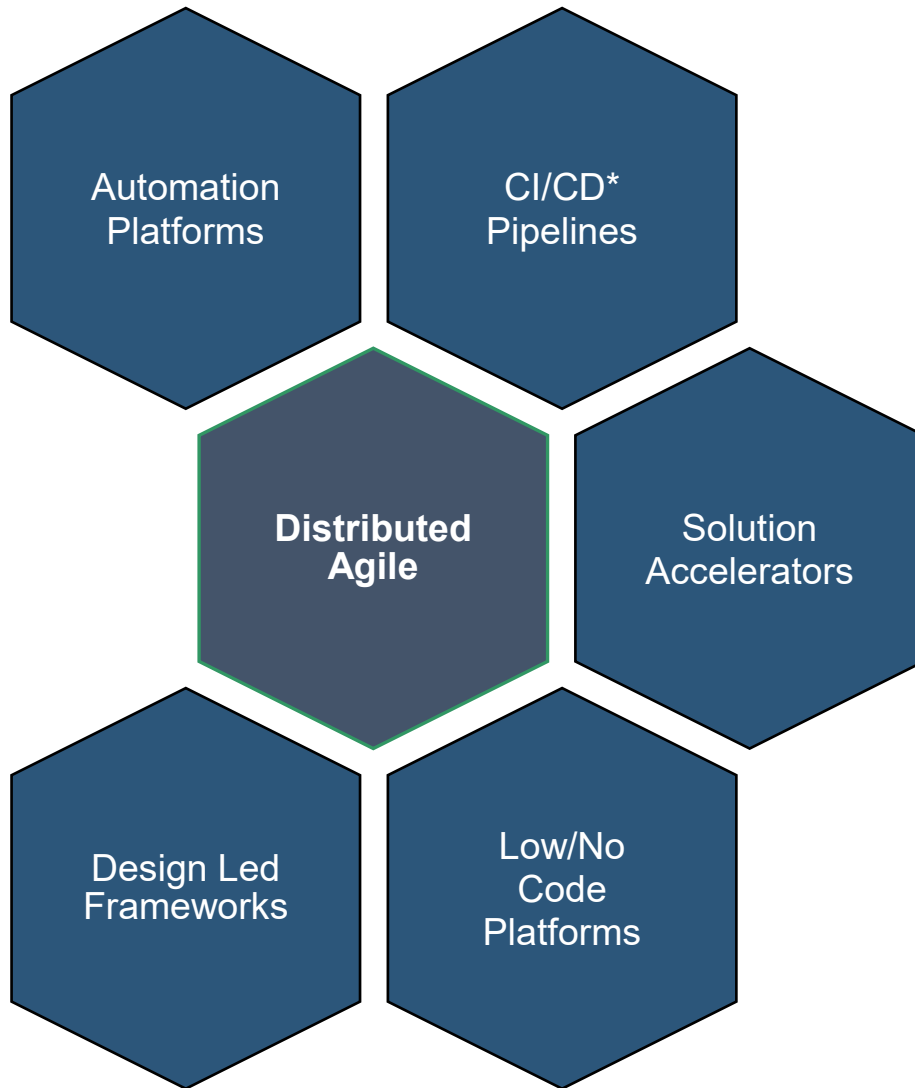
*Continuous integration (CI)/Continuous delivery (CD)

CLIENT ENGAGEMENT WITH PARTNER ALLIANCES

Microsoft	aws	Google

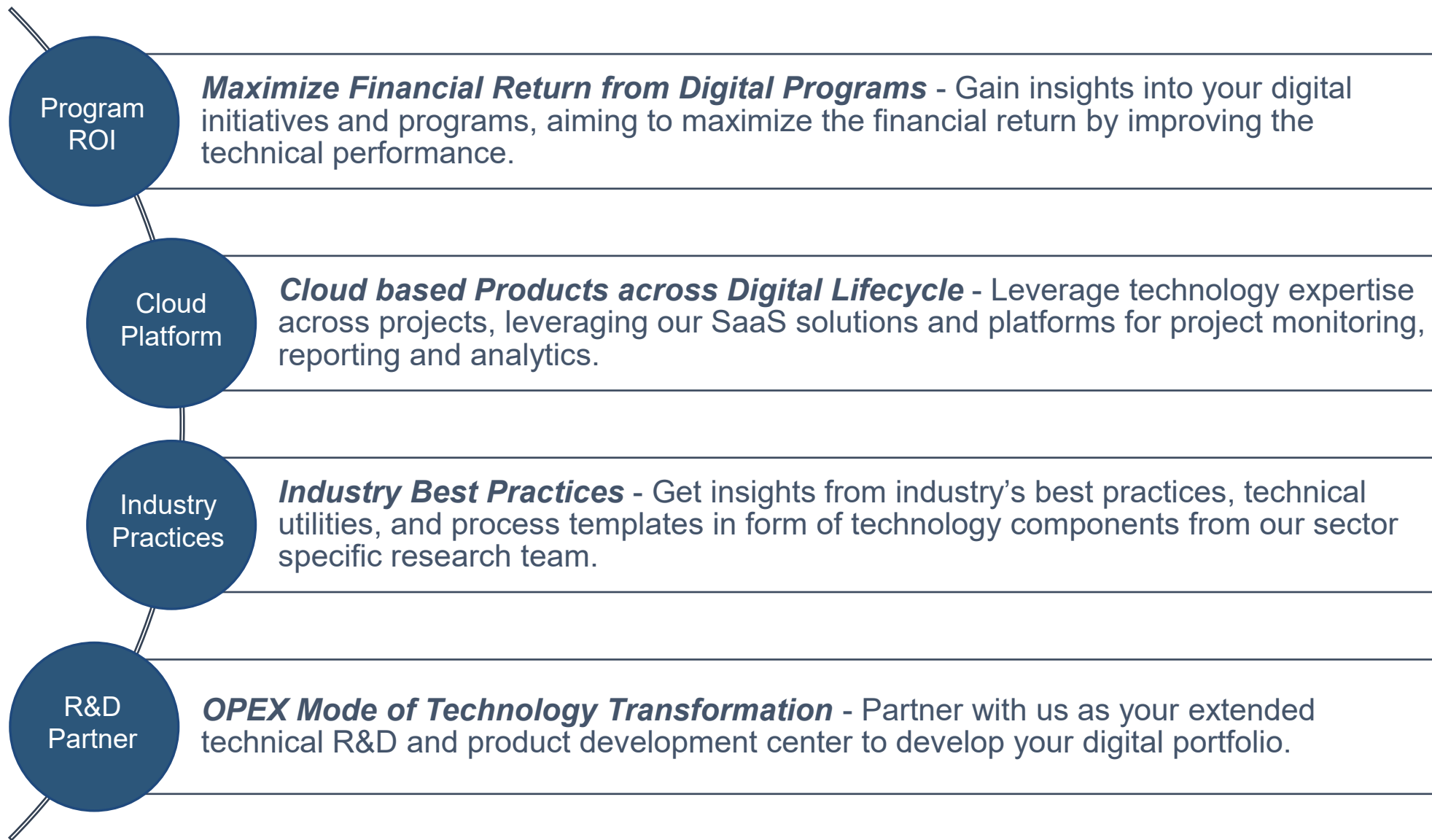| Engagement Model	Business Alignment	Commercial Flexibility	Solutions Design	Risk Management
• On demand services partner • Platform approach with "Cloud-Mobile-AI" as design strategy	• Solutions based on digital innovation and business demands • Lower TCO by adopting Cloud, Hybrid stack using Open Source and prototyping using SCRUM	• Outcomes based contracts • Business SLAs instead of operational SLAs	• 90 days of rapid development on MLOps Platform (Azure/GCP/AWS) • Platform scale approach with open API design	• OPEX model of technology transformation • Partnered with leading technology cloud vendors

PARTNERSHIP BENEFITS

Program ROI

Maximize Financial Return from Digital Programs - Gain insights into your digital initiatives and programs, aiming to maximize the financial return by improving the technical performance.

Cloud Platform

Cloud based Products across Digital Lifecycle - Leverage technology expertise across projects, leveraging our SaaS solutions and platforms for project monitoring, reporting and analytics.

Industry Practices

Industry Best Practices - Get insights from industry's best practices, technical utilities, and process templates in form of technology components from our sector specific research team.

R&D Partner

OPEX Mode of Technology Transformation - Partner with us as your extended technical R&D and product development center to develop your digital portfolio.

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THANK YOU

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