



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

19-20 NOVEMBER 2024 | BANGKOK, THAILAND



Building Foundation for Digital Transformation

Belly Agustinus Kartika Djaya



Challenges

- Manual data capture and processing
 - Data redundancy
 - Time consuming for data preparation, extraction, and validation
- Missing data governance
 - Nonstandard well naming, unit of measurement, decimal precision
 - Missing data ownership and authorization
 - No audit and information tracking
 - Missing backup and recovery plan
- Less collaboration
 - Individual dependency
 - Scattered data sources



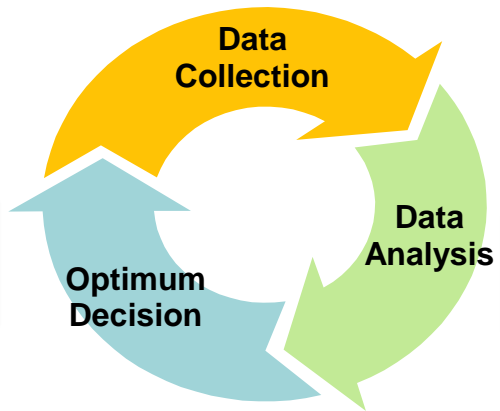
Multiple Data Collection

Work & Process Redundancy

Disconnection

Solution Architecture

Data Collection
Manual | Automated

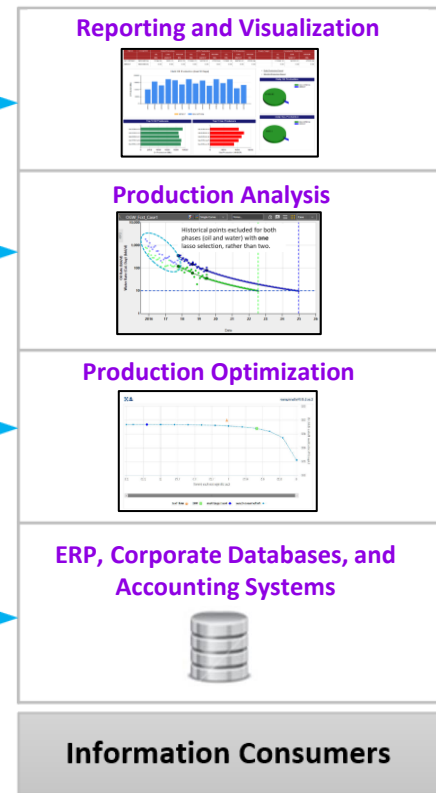
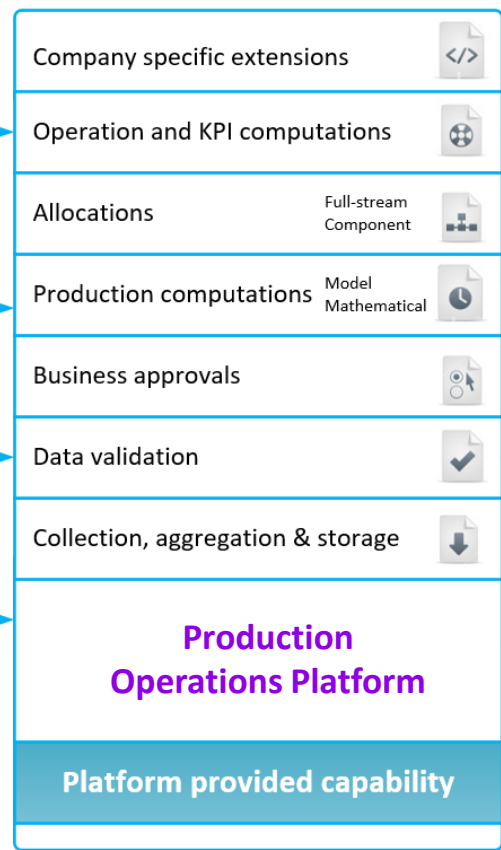


Integrated Analytics
Descriptive | Predictive | Decision

Information Processing
Analyze | Collaboration

Operational Data

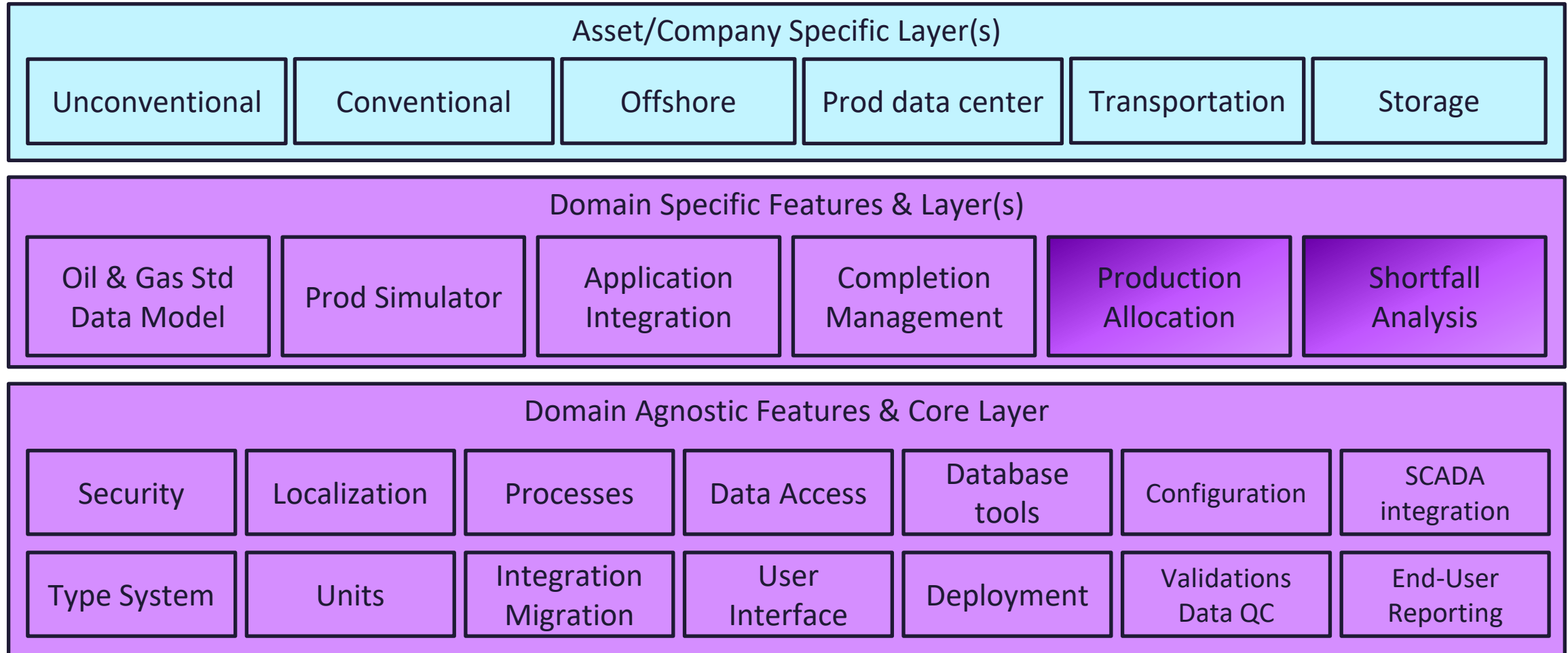
- Daily/Monthly Production
- Well Status
- Well Head
- Pump
- Well Test



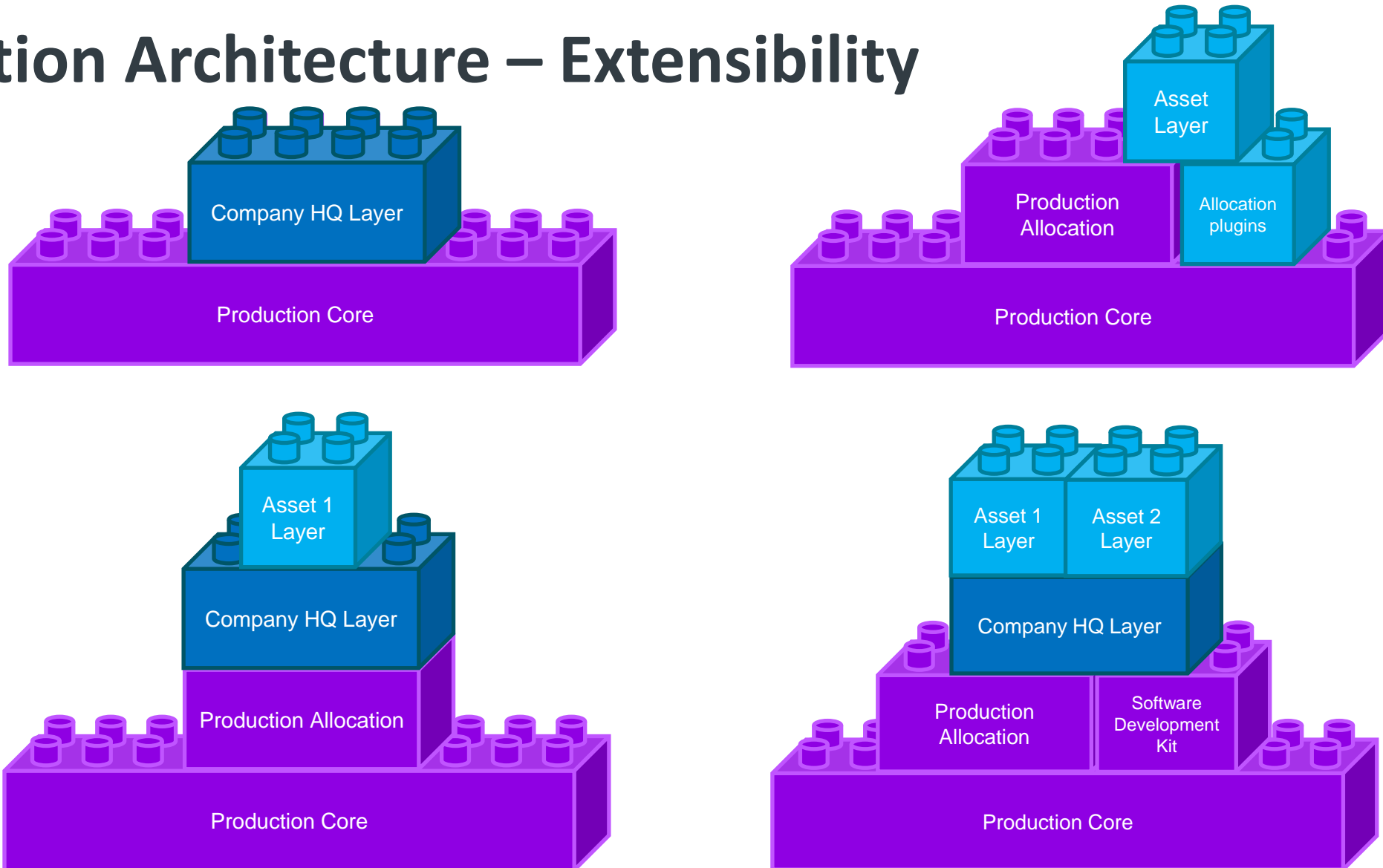
Head Office



Solution Architecture – Extensibility



Solution Architecture – Extensibility



Result – Significant Time Reduction

Data Capture Process

Before

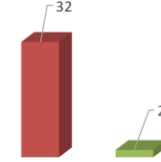
- [5 mins] Open email & attachment
- [5 mins] Perform data compilation
- [15 mins] Data checking and validation
- [5 mins] Data checking and validation
- [2 mins] Save to local storage

Daily Report Distribution via email

After

- [1 mins] Automatic Email Processing and Data Capture
- [1 min] Save to Centralized Database

Reduced Time Spent (minutes)



Before After

Reporting Process

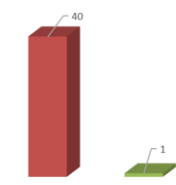
Before

- [5 mins] Open data compilation archive
- [15 mins] Extract necessary data for reports
- [15 mins] Compile formal report
- [5 mins] Report review and distribution

After

- [1 mins] Open desired Web Report interactively

Reduced Time Spent (minutes)



Before After

Back Allocation Calculation Process

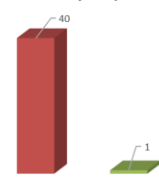
Before

- [5 mins] Open monthly data reconciliation
- [15 mins] Extract necessary data for reports
- [15 mins] Compile formal report
- [5 mins] Report review and distribution

After

- [1 mins] Open desired Web Report interactively

Reduced Time Spent (minutes)



Before After

- Over 90% Time Reduction for routine processes
- 1.6 days/month extra time for engineering analysis

Result – Domain Collaboration Analysis

OFM 23.1 - D:\OFM\Demo Workspace\Provo_Template.ofm

WORKSPACE Home Setup View Plug-Ins

Analysis Plot Forecast Report Grid Contour Surface Bubble Map XY Scatter Well Log Multi-Well Log Log Report Cross Section Well Diagram Catalog

Launch analysis Select well Adjust display

Wellbores (151) ACL 10-25

Analyses Base Map: Overview Analysis

Reporting 1

- Analysis 2
 - Line 1
- Analysis 3
 - Type Well 1
- Analysis 4
 - CDF 1
- Completion Comparison
- Forecast & Heatmap
 - Pie/Treemap
- Forecast
- Historical Production R
 - Historical Production Line 1
- Operator Performance
 - Commulative Oil Vo
 - Bar 1
 - Scatter 1
- Overview Analysis
 - Overview Map
 - Production Report
 - Production Plot
 - Wellbore
 - Well Log
 - Plots
 - Comprehensive Plot
 - Pressures
 - Producing Rates Plot
 - Rate-Cumulative Declin
 - Rate-Time Decline, Serr

Ov Maps: EsriMapImagery (WorldImageryMap)

Production

Date	ACI Cum Volum
1	2/28/1985 2.13
2	3/31/1985 3.32
3	4/30/1985
4	5/31/1985 1.34
5	6/30/1985 4.64
6	7/31/1985 2.41
7	8/31/1985
8	9/30/1985
9	10/31/1985 0.00
10	11/30/1985 1.55
11	12/31/1985 0.32

Wellbore

Well Log

Wellbores (151)

- > -# ACL 10-10 (1)
- > -# ACL 10-12 (1)
- > -# **ACL 10-25 (1)**
- > -# ACL 10-31 (1)
- > -# ACL 10-32 (1)
- > -# ACL 11-23 (1)
- > -# ACL 11-30 (1)
- > -# ACL 11-7 (1)
- > -# ACL 13-8 (1)
- > -# ACL 14-10 (1)
- > -# ACL 16-31 (1)
- > -# ACL 2-3 (1)
- > -# ACL 2-8 (1)
- > -# ACL 3-2 (1)
- > -# ACL 5-18 (1)
- > -# ACL 6-1 (1)
- > -# ACL 6-11 (1)
- > -# ACL 6-12 (1)
- > -# ACL 6-13 (1)
- > -# ACL 6-14 (1)
- > -# ACL 6-17 (2)
- > -# ACL 6-18 (1)
- > -# ACL 6-29 (1)
- > -# ACL 6-32 (1)
- > -# ACL 6-33 (1)
- > -# ACL 6-5 (1)
- > -# ACL 6-7 (1)
- > -# ACL 6-9 (1)

Production Plot

Cum Oil Prod: 21.27 Mbbbl

Produced Oil Volume (bbbl)

Produced Gas Volume (Mcf)

Y Axis:1 - Produced Oil Volume

- PRD.OIL (bbbl) ACL 10-25

Y Axis:2 - Produced Gas Volum

- PRD.GAS (Mcf) ACL 10-25

Wellbore image for ACL 10-25 located at D:\ Wellbore image for ACL 10-2

Conclusion and Benefits

- Single Source of Truth
 - Eliminate data redundancy and data integrity assurance
- Workflow and efficiency
 - Eliminate duplicated workflows, focus on engineering analysis
- Domain collaboration
 - Knowledge management across disciplines within organization
- Higher Confident Decision
 - Most recent data for analysis



Data Integrity ▲

Efficiency & Productivity ▲

Process Simplification ▲

Collaboration ▲



Acknowledgement

- Giang Hai Tung (Sensia)
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