



human energy®

Delivering digital well designs faster, through dynamic subsurface model integrations

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September 2022

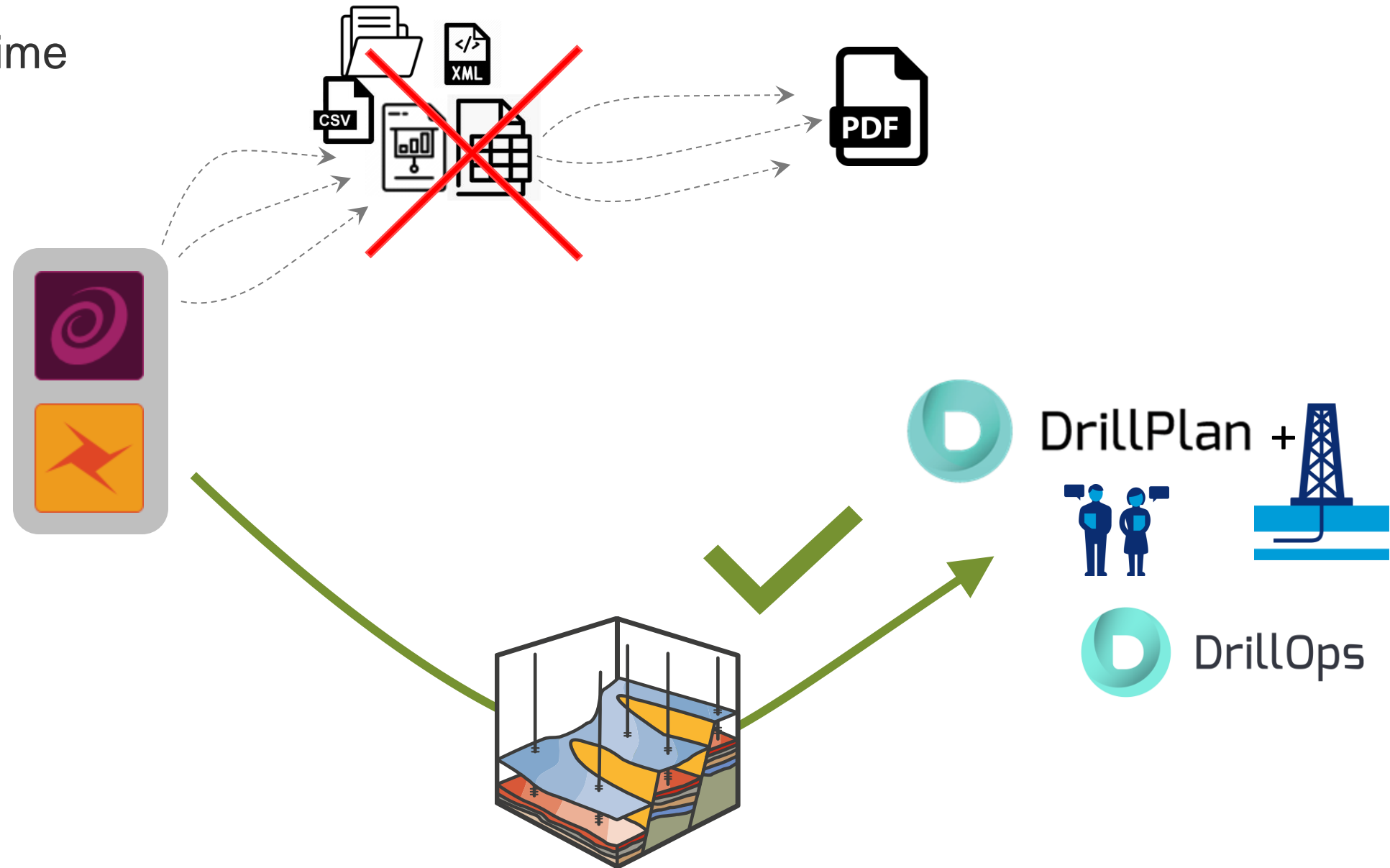
integrated well planning workflows

Problem – Data handling wastes time & decreases model fidelity

- Static and unique exports
- Slow iteration processes
- Hamstrung collaboration

Solution – Integrations via a centralized model with a shared planning space

- Faster well planning processes
- Users focus on design and safety



integrated well planning workflows

Subsurface



Targets & Trajectories



Mechanical Earth Model (PPFG)



Formation Tops



Subsurface Drilling Hazards

Wells



DrillPlan

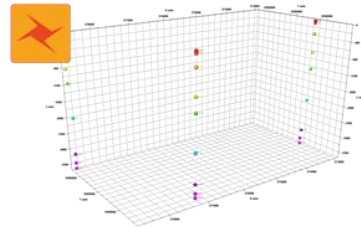
Surface Location SHARED 13:56, Jan 08 2021	Wellbore Geometry SHARED 14:14, Jan 08 2021	Target1 SHARED 13:57, Jan 08 2021
Formation Top SHARED 14:10, Jan 08 2021	Pressure Window SHARED 14:11, Jan 08 2021	Formation Temperature COMPLETED 17:03, Jan 18 2021
Risks SHARED 10:58, Jan 28 2021	Activity Plan SHARED 10:58, Jan 28 2021	12.25" Drilling Fluid Program ★★★★★ 14:22, Jan 08 2021 SHARED
Casing Design SHARED 16:40, Jan 08 2021	Kick Tolerance Calculation SHARED 16:06, Jan 08 2021	PT1_Plan 1 (Katy Nov_USL_KF5.pet) ★★★★★ 19:11, Jan 25 2021 SHARED

data review and
decision making

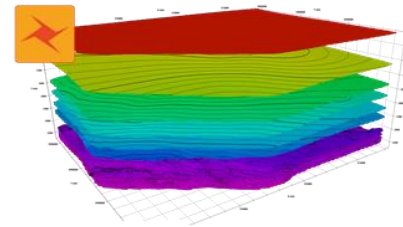
integrated well planning workflows

Formation Tops

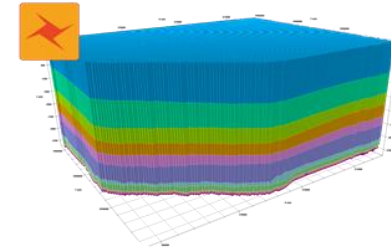
Well Tops/Markers



Surfaces



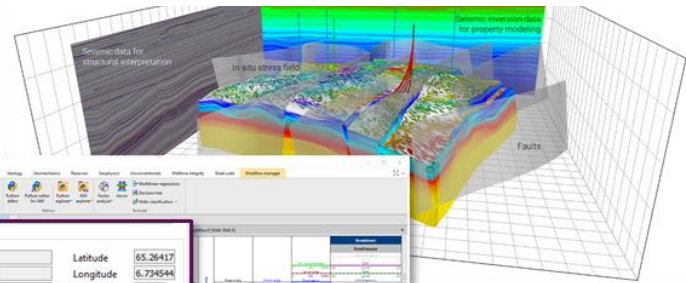
Grids



Trajectories & Targets direct connect (non-OSDU)



MEM / PPFG



MEM Ingestion

Name	Well A	Latitude	65.26417
Client	Centrica Resources (Norge) AS	Longitude	6.734544
CRS		Valid Area	0 m

DrillPlan Well	Client	Created On
<input type="checkbox"/> Coniston 10H	Demo	3/10/2021 9:58 AM
<input type="checkbox"/> FG-test	slb	7/13/2020 3:26 PM
<input checked="" type="checkbox"/> Well_nest	AbTC	1/22/2021 8:37 AM
<input type="checkbox"/> York G01	Demo	3/10/2021 11:24 AM
<input type="checkbox"/> York G17	Demo	3/10/2021 10:38 AM

OSDU

Geomechanics Insights

DrillPlan

Subsurface Hazards



Subsurface Hazards Data Table

ID	Name	Type	Category	Depth (m)	Pressure (bar)	Temperature (°C)	Status
1	Well A	Well	Production	1000	100	100	Active
2	Well B	Well	Production	1200	120	120	Active
3	Well C	Well	Production	1400	140	140	Active
4	Well D	Well	Production	1600	160	160	Active
5	Well E	Well	Production	1800	180	180	Active
6	Well F	Well	Production	2000	200	200	Active
7	Well G	Well	Production	2200	220	220	Active
8	Well H	Well	Production	2400	240	240	Active
9	Well I	Well	Production	2600	260	260	Active
10	Well J	Well	Production	2800	280	280	Active



UCR 1H-2023

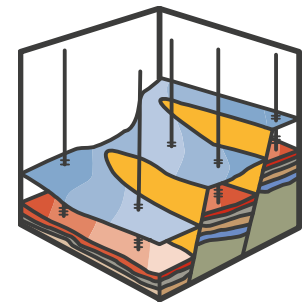
integrations cut data share effort by >75%
the fastest Chevron well planning ever

4 well pad example



Petrotechnical Suite

- 1 upload of targets & trajectories
- 1 sub-regional MEM
- 1 formation top model
- 1 study of hazards



Centralized subsurface
model



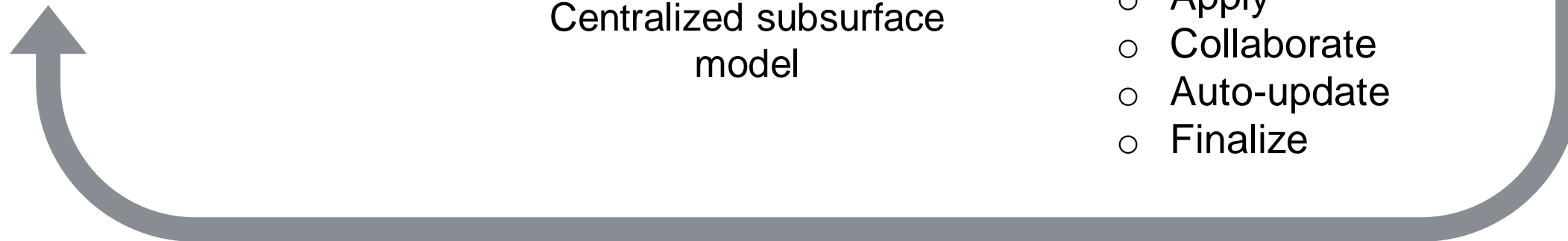
DrillPlan



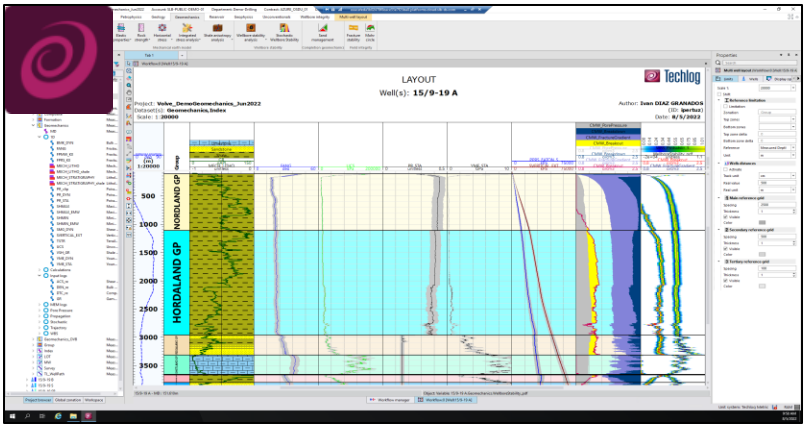
- Apply
- Collaborate
- Auto-update
- Finalize



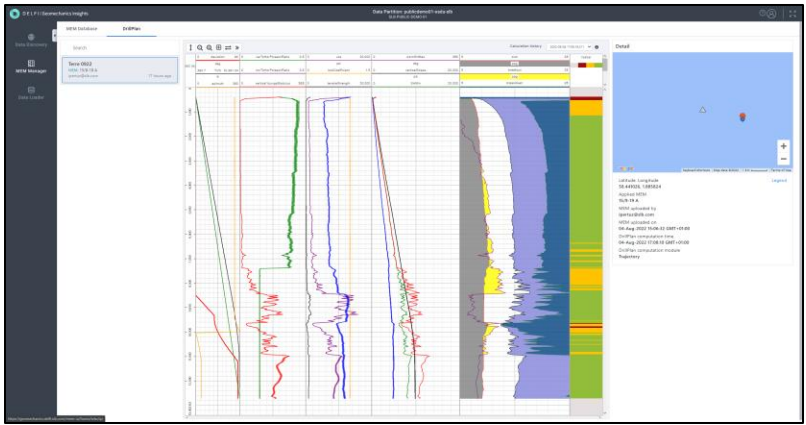
DrillOps



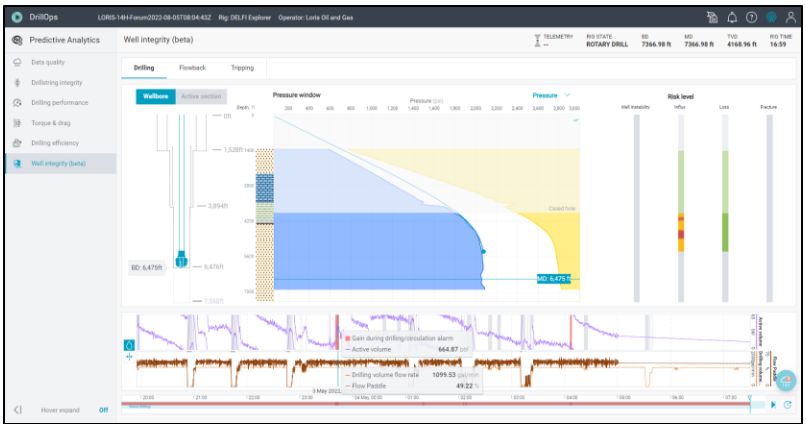
closed-loop workflow



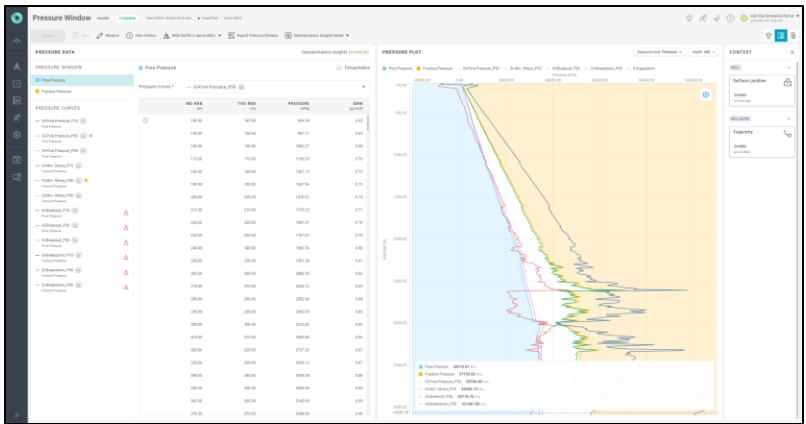
 **DELFI** | Petrotechnical Suite



 **Geomechanics Insights**



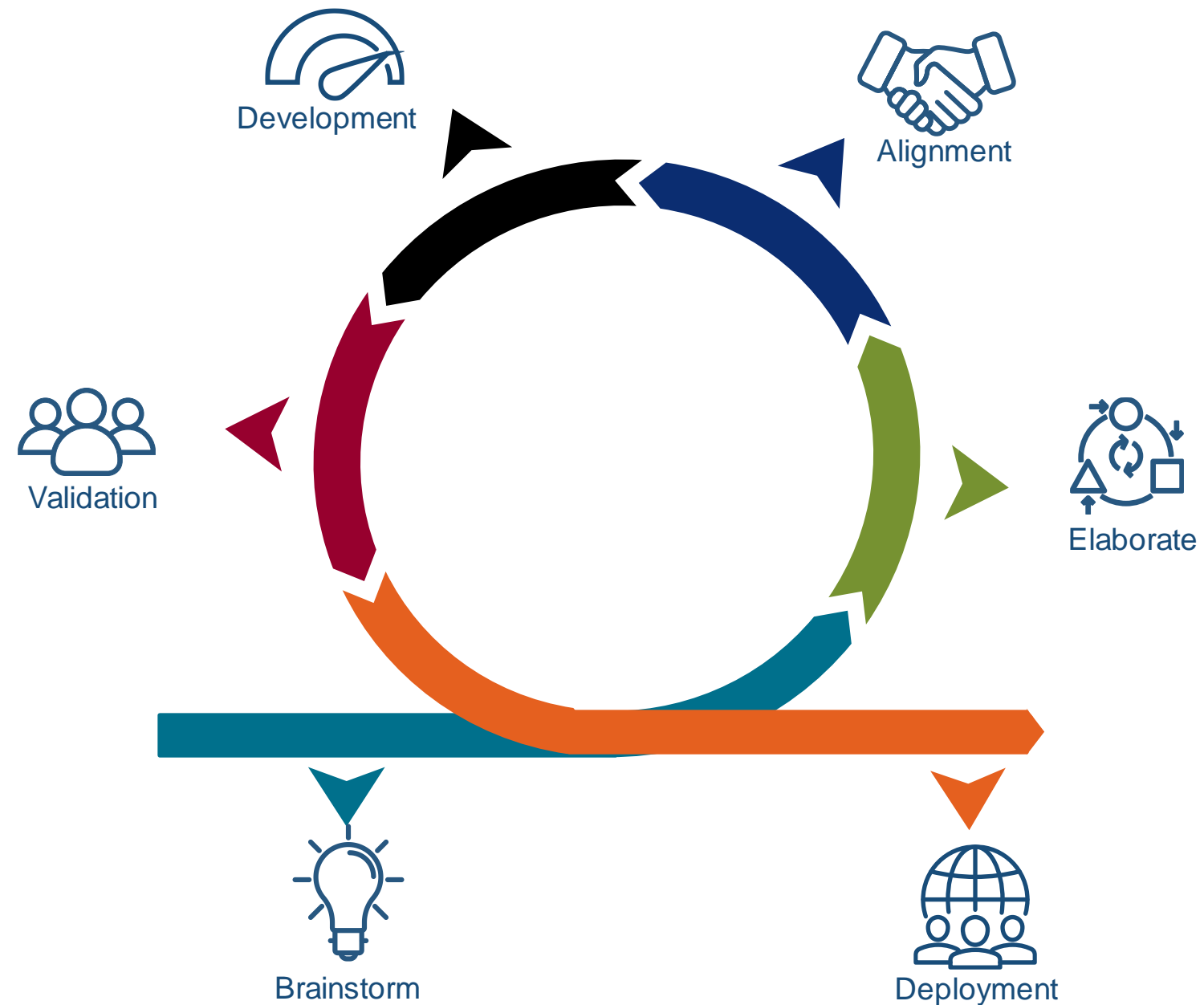
 **DrillOps**



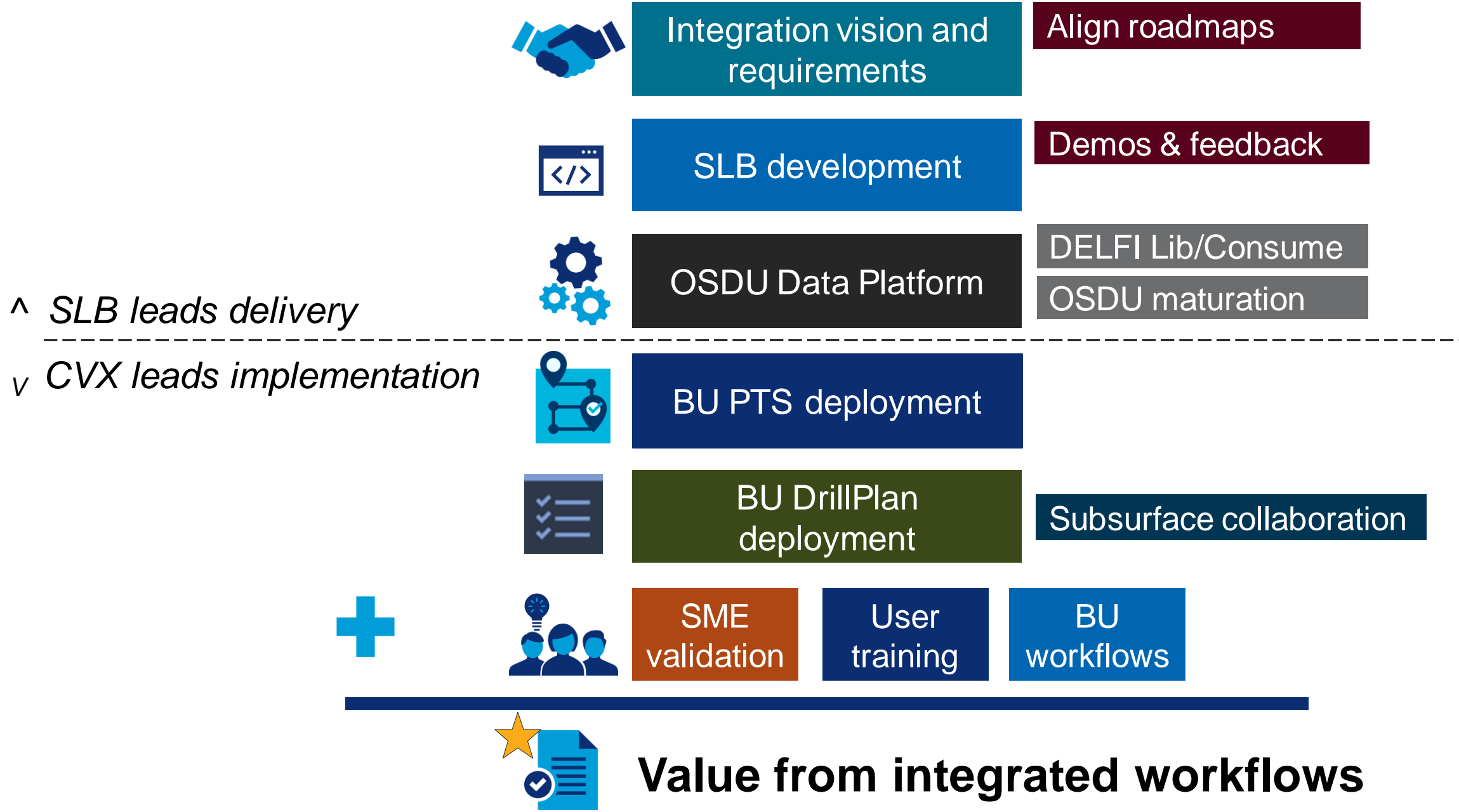
 **DrillPlan**



workflow development cycle



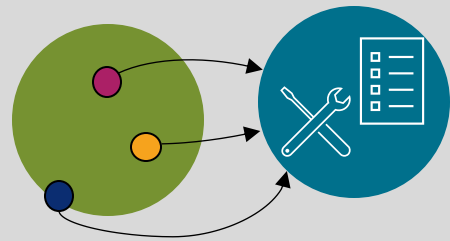
Integration partnership and dependencies



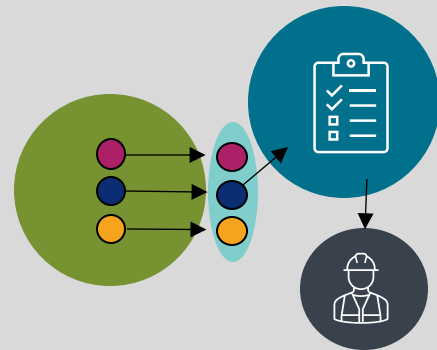
integration vision

accelerating the data foundation and expanding possibilities

Today
↓



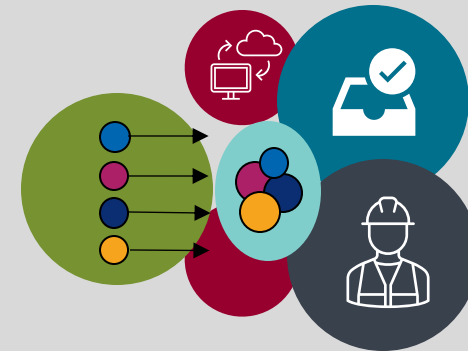
connect



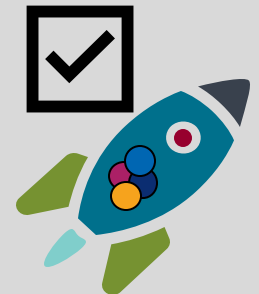
liberate &
integrate



expand & couple
integrations



augment &
optimize



automate

OneTeam well planning



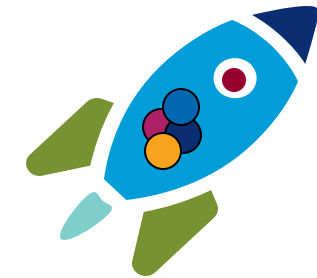
central data model



**partnered
development**



**enabling our
people**



the future, faster

the future is liberated, the future is integrated