



Use of Digital to Enhance Well Productivity

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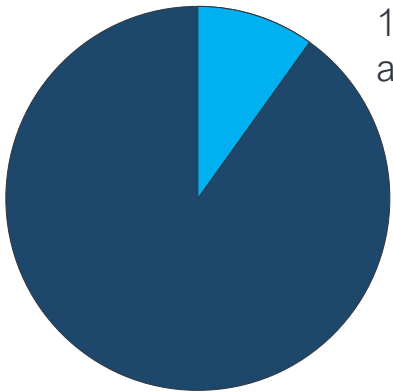


The value of the Norwegian Petroleum Directorate's data (2023)



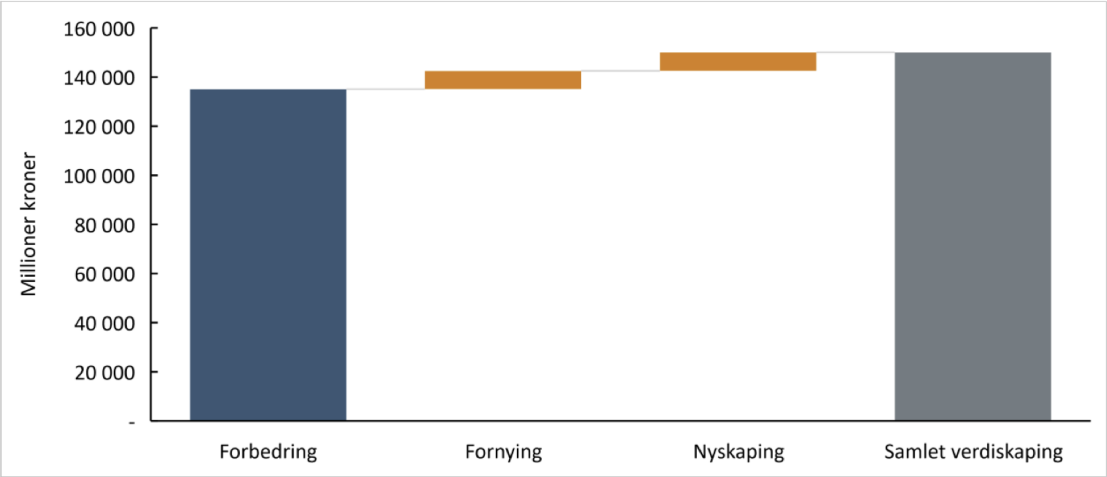
NOK 150 billion is the contribution of the data economy to value creation

90% of the value creation is related to using data as an input to increase efficiency. This largely corresponds to gains related to time and resource savings.



10% is related to renewal and innovation

Figur 4.10 Dataøkonomiens bidrag til verdiskaping fordelt på forbedring, fornying og nyskaping i 2020. Kilde: Menon Economics

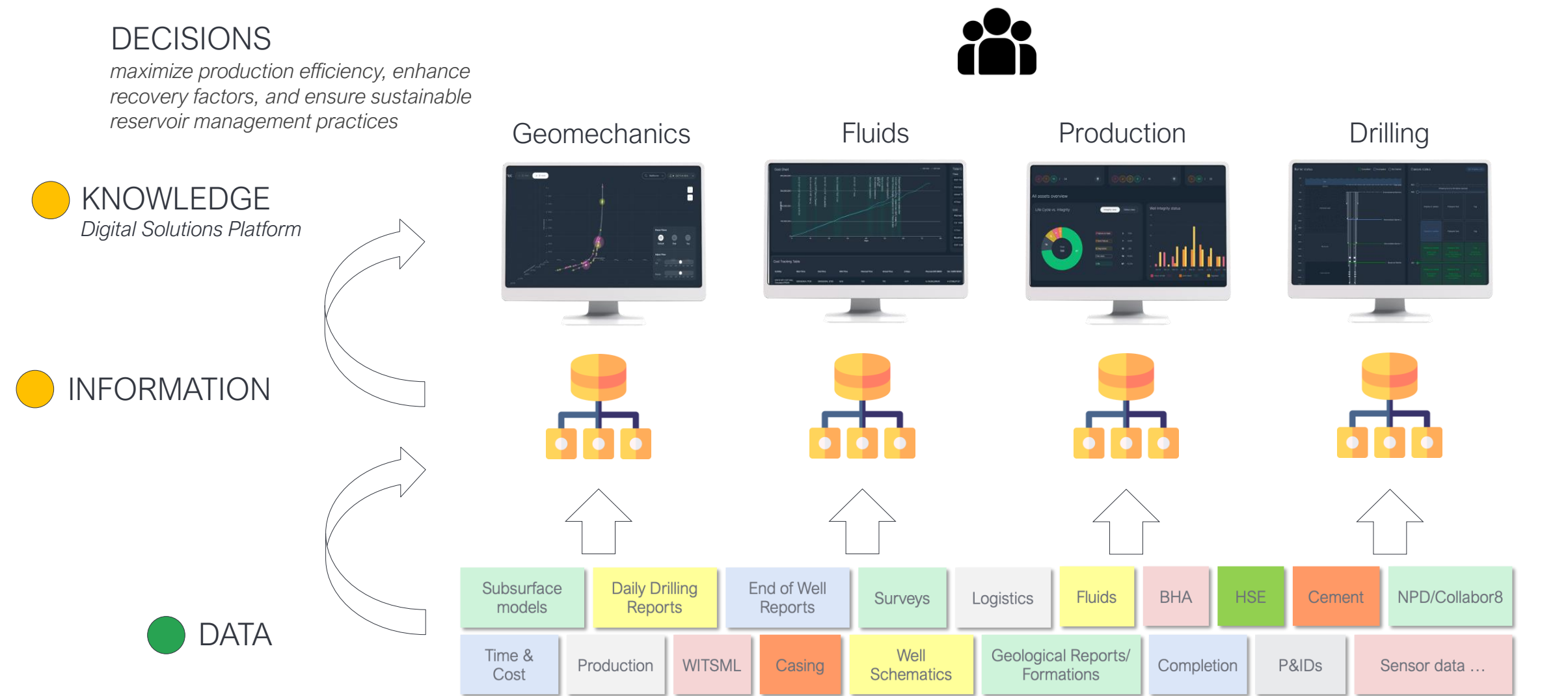


Figur 4.1 Oppsummering: Verdien av Oljedirektoratets data



Aktørgruppe	Tids- og ressursbesparelser	Kvalitetsgevinster	Innovasjon, nyskaping og øvrige virkninger
 Petroleumsnæringen	1,5 milliarder kroner i årlig verdi, samt store kvalitetsgevinster for petroleumsnæringen		
	Svært store tids- og ressursbesparelser Oljedirektoratets datadeling er estimert å spare rettighetshavere og operatører for 1 321 millioner kroner årlig. Diskos: 257 – 1 255 mnok/år Åpne data: 12 – 1 312 mnok/år	Store kvalitetsgevinster I fravær av Oljedirektoratets data, ville 41 prosent av rettighetshavere og operatører i stor grad opplevd dårligere eller vesentlig dårligere kvalitet i sin oppgavegjennomføring. Diskos: 36 % Åpne data: 43 %	Store positive innovasjons- og nyskapingeffekter Oljedirektoratets data er estimert å bidra til innovasjon og nyskaping for rettighetshavere og operatører tilsvarende 147 millioner kroner årlig.
 Andre næringer	Tids- og ressursbesparelser Oljedirektoratets åpne data sparer en begrenset andel aktører innen rådgivnings- og analysenæringer for tid og ressurser.	Kvalitetsgevinster En opplevd kvalitetsgevinst for øvrige næringer knyttet til tilgjengeligheten av åpne data, i stor grad fremfor faktisk bruk.	Innovasjons- og nyskapingseffekter Oljedirektoratets åpne data har bidratt til en håndfull bedrifter, samt utvikling av tjenester som ikke ville kunne blitt utviklet foruten de åpne dataene.

Data automation supports complex challenges





WELLS

Tracking Fluids

Tracking Fluids



Daily Fluid Reports ...

... Mud specs automatically
extracted from reports ...

...and displayed in web-App
(trends Vs current specs)



Tracking Fluids



Significant time savings. No more manual work required

Increase awareness on critical issues that can cause formation damages and compromise wellbore stability (correspondences with fluid parameters out of spec)

Information in context. Complex knowledge available also for non mud engineers

Performance based engagements with the mud providers. >30% of critical parameters are out of specs

Reports in PDF present a lot of challenges: scanned in poor quality, written in different ways, different tables to represent the same information across multiple reports ... better when they are sent via XML format

WITSML fluid data are often different from the data reported by the mud engineer

WHAT IS THE SOURCE OF TRUTH?

Perhaps **both**. Fluid reports are necessary and WITSML can be used for calibration purposes

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Geomechanics

SUBSURFACE

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From descriptions to a database of critical events



Reporting tools
(SQL databases)



PDFs, XML



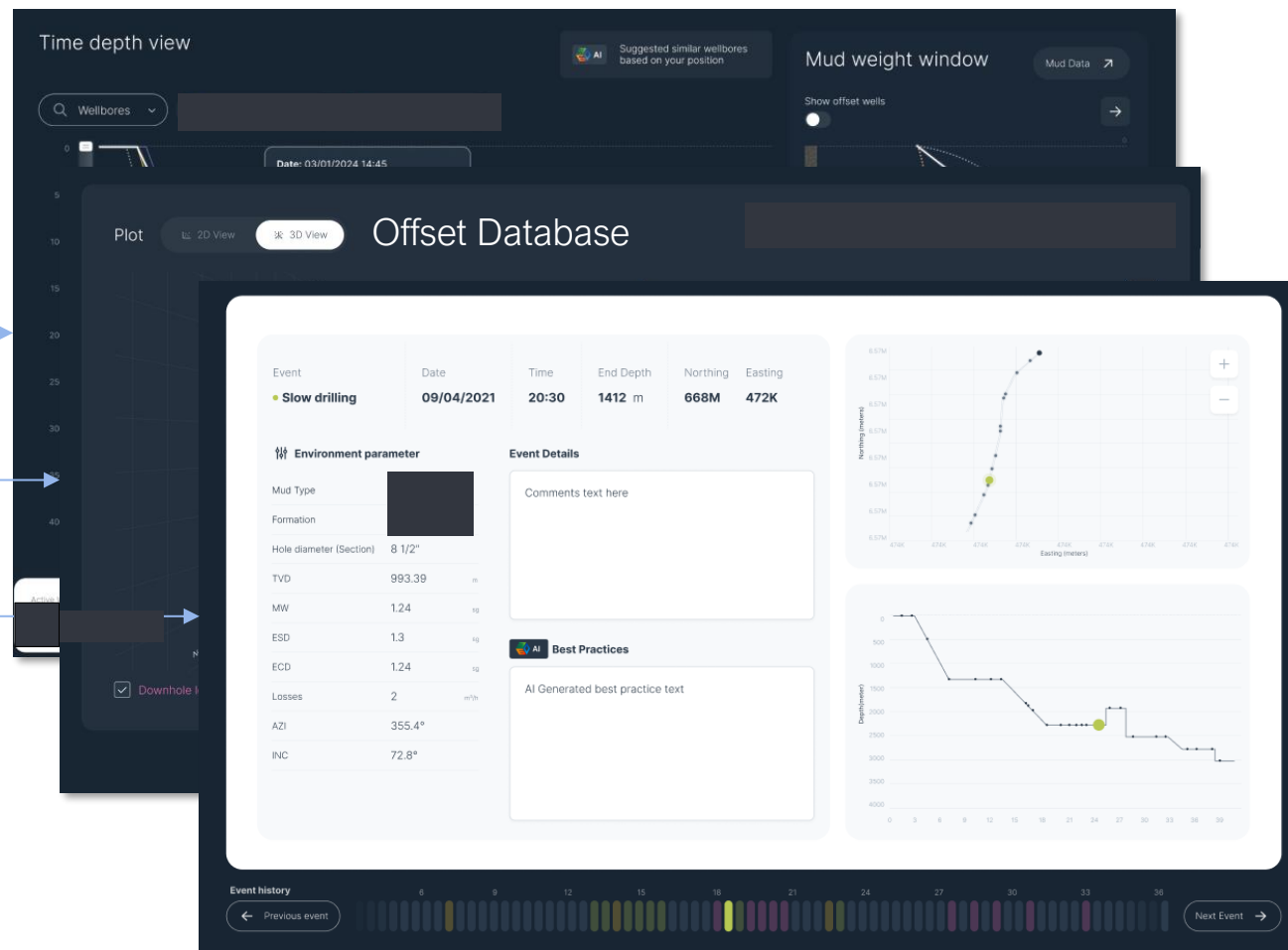
WITSML

API
calling data at
higher
frequency



DATA MODEL:
Activity Structure
Domain functions

Automated Geomechanics Monitoring: saved 26 weeks of manual work



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Conclusions



Data can provide valid support to monitor and evaluate enhancement measures for well productivity (examples of fluid management and geomechanical analysis)

The data automation journey needs to be linked to value creation where the needs are more painful. Data has to be translated into useful information. Understanding the domain and the processes is paramount, as they translate into key data science and data modeling

Technology is mature to switch from PDF, Excel, and emails to web page applications that display operational data. Unlocking this data offers immense opportunities for all the cases supporting well productivity. The benefits touches all the levels of an enterprise and set the example for partners and third parties



THANK YOU

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