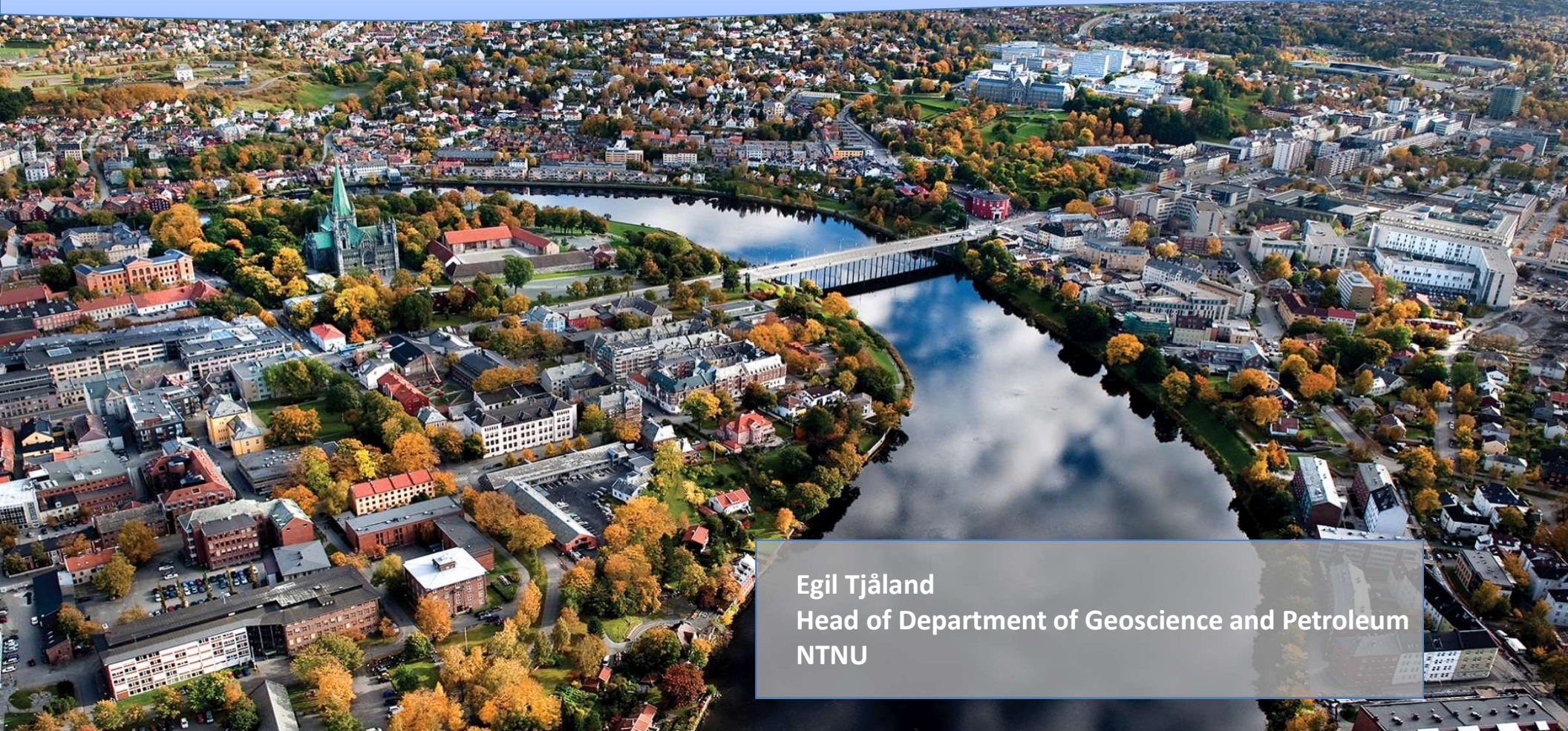


# BRU21 Technologies of the future for O&G



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NTNU

# New NTNU 2016



TRONDHEIM



GJØVIK



ÅLESUND

# BRU21 – NTNU strategy for Oil and Gas

## 41 Fact finding meetings with the industry & authorities

- ❑ What are the major challenges for the O&G industry?
- ❑ What are “break-through technologies” for oil prices at 30 \$?
- ❑ How can NTNU contribute to deliver future technologies & education in O&G?



BRU21 Report – NTNU Strategy for Oil & Gas [www.ntnu.edu/igp/bru21](http://www.ntnu.edu/igp/bru21)

## BRU21

Better Resource Utilization in the 21st century

## NTNU Strategy for Oil and Gas

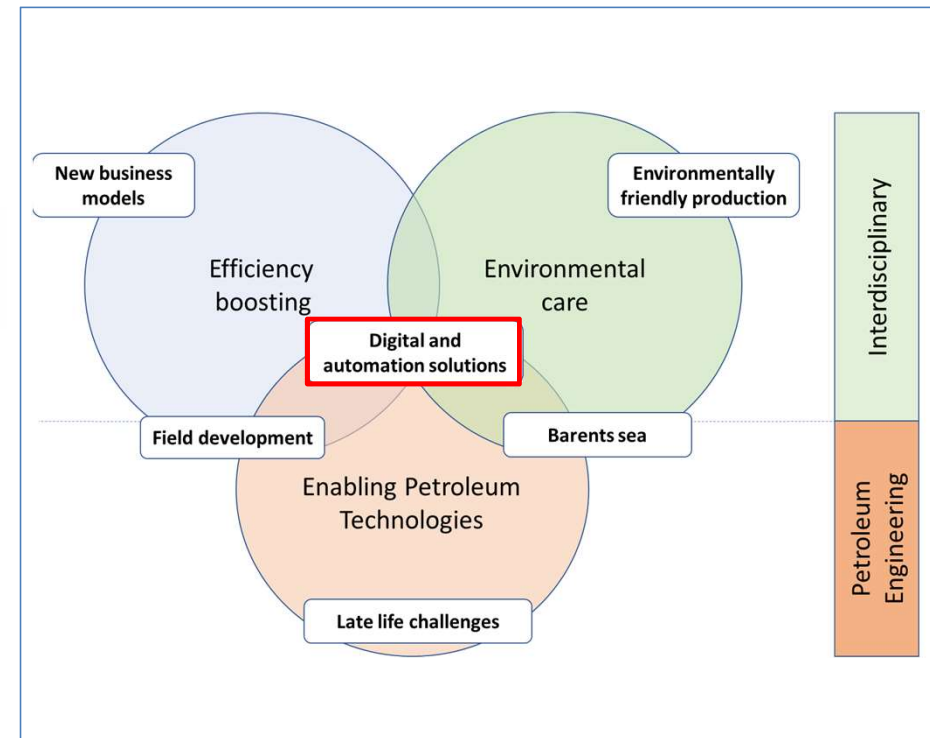
What are the major challenges for the O&G industry on the Norwegian Continental Shelf in the future and the contribution from academia for solutions

# CONTENT

1.0	Introduction by NTNU's Rector, Gunnar Bovim .....	3
2.0	BRU21 Vision and objective .....	4
3.0	Fact Finding meetings – discussion between NTNU and the petroleum industry .....	6
4.0	Global energy demand and the climate challenge - IEA Report Kamel Ben Naceur, Director Directorate of Sustainable Energy Policy and Technology, International Energy Agency (IEA) .....	10
5.0	Long-term aspects for O&G on the Norwegian Continental Shelf .....	12
6.0	Oil and Gas for the 21st century – OG21 Strategy summary .....	16
7.0	Technology of the future – NTNU research and education .....	19
7.0	Introduction .....	20
7.1	Digitalization in O&G .....	21
7.2	The Barents Sea .....	27
7.3	Field development and area strategies .....	32
7.4	Environmental friendly O&G production .....	38
7.5	New business models for oil companies and suppliers .....	43
7.6	Late life challenges and decommissioning .....	45
8.0	The way forward – NTNU strategy .....	49
9.0	Technologies of the future – Industry topics .....	53
9.1	Reducing the break-even price per barrel at NCS (AkerSolutions) .....	54
9.2	The nature of exploration on the NCS (Lundin) .....	56
9.3	Digitalization of the O&G sector (DNV GL) .....	58
9.4	Our Digital Future (Petoro) .....	60
9.5	New business models – Integrated approach to field development (OKEA) .....	62
9.6	Always safe, high value and low carbon (Statoil) .....	63
9.7	Environmental O&G Development (Siemens) .....	64
9.8	The CO <sub>2</sub> Value Chain (AkerSolutions) .....	66
9.9	The Norwegian CO <sub>2</sub> Storage Atlas (NPD) .....	68
9.10	CO <sub>2</sub> Emissions from global O&G Fields (NMBU/Ås University) .....	70
9.11	Greater Ekofisk Future Well Plugging and Abandonment Activity (ConocoPhillips) .....	72
10.0	BRU21 Project Team & Editorial Team & Editorial Support Team .....	74



## BRU21 - NTNU Strategy for Oil and Gas Six areas identified in the fact finding meetings



# BRU21 Next Step - Digital & Automation Solutions for O&G

Focus Next Step 2018

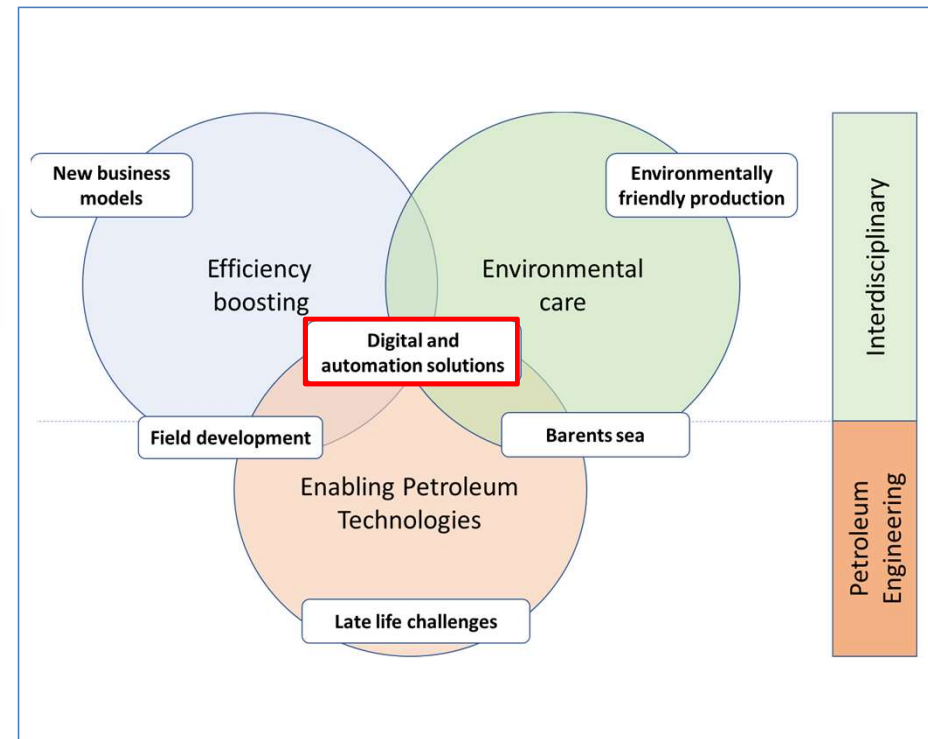
Research and Innovation Program in Digital and Automation Solutions for the O&G Industry



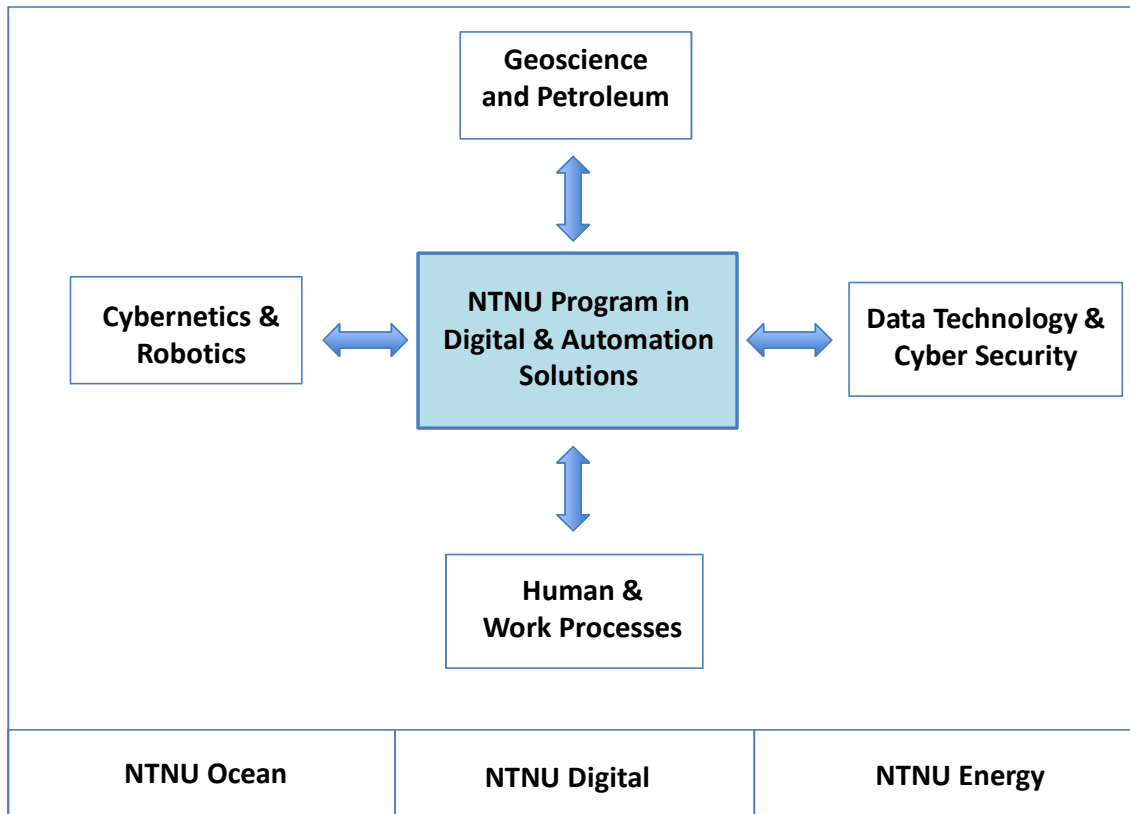
Use cases  
For discussion with the Industry



BRU21 - NTNU Strategy for Oil and Gas  
Six areas identified in the fact finding meetings



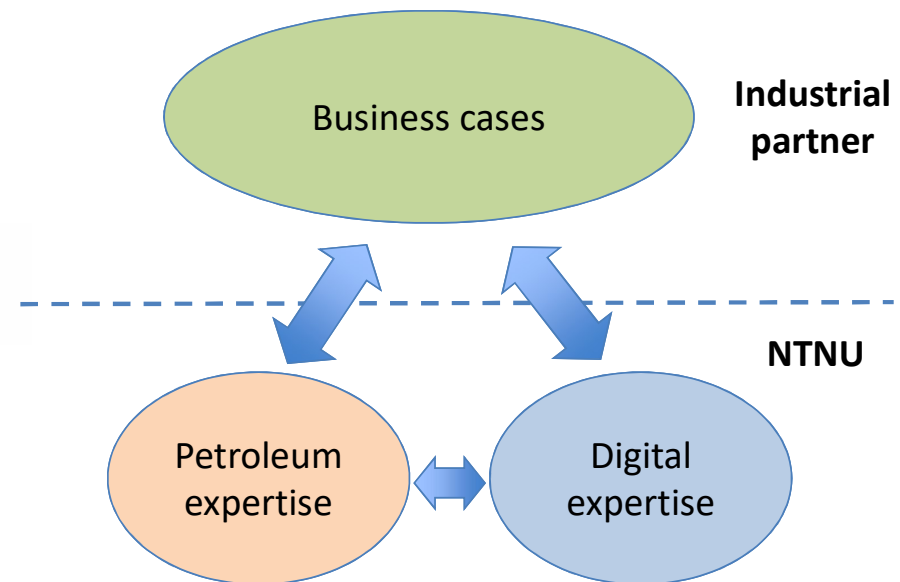
# Multidisciplinary collaboration across NTNU



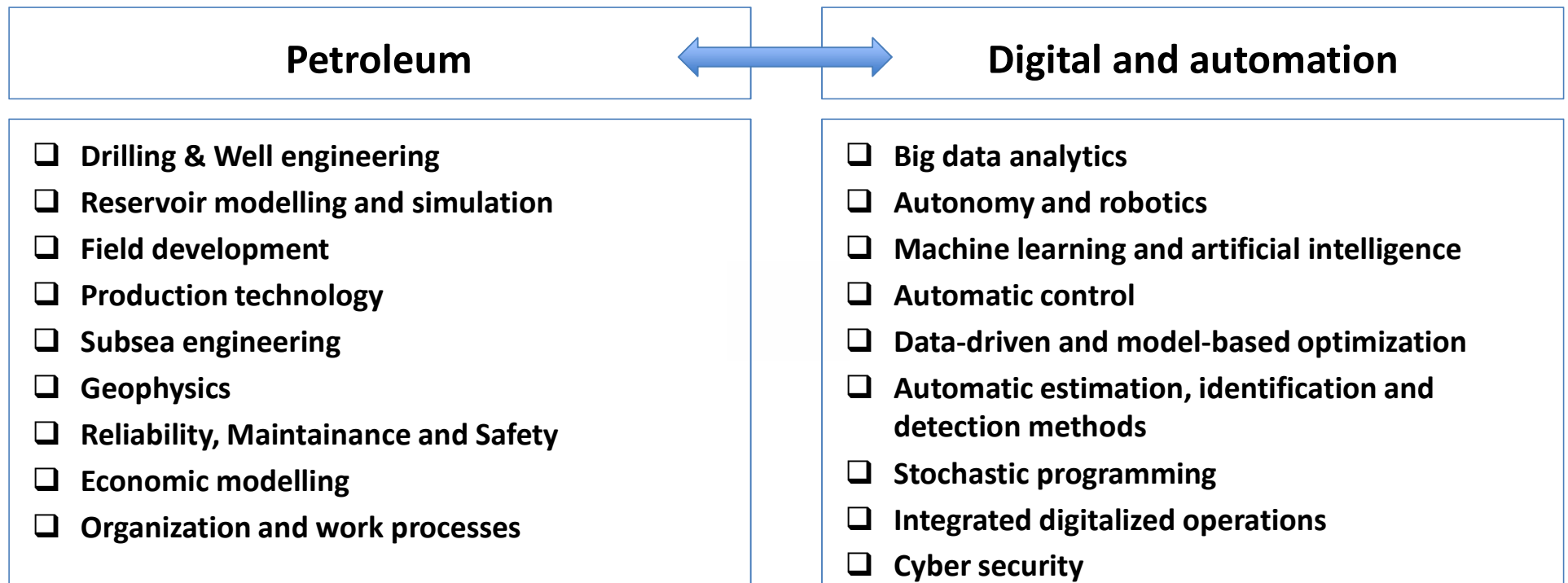
# NTNU - Industry collaboration

## Fast transition of research results to life

- Close cooperation with industrial partner
- Implementation through industrial partner
- Commercialization through 3<sup>rd</sup> parties
- Commercialization through start ups

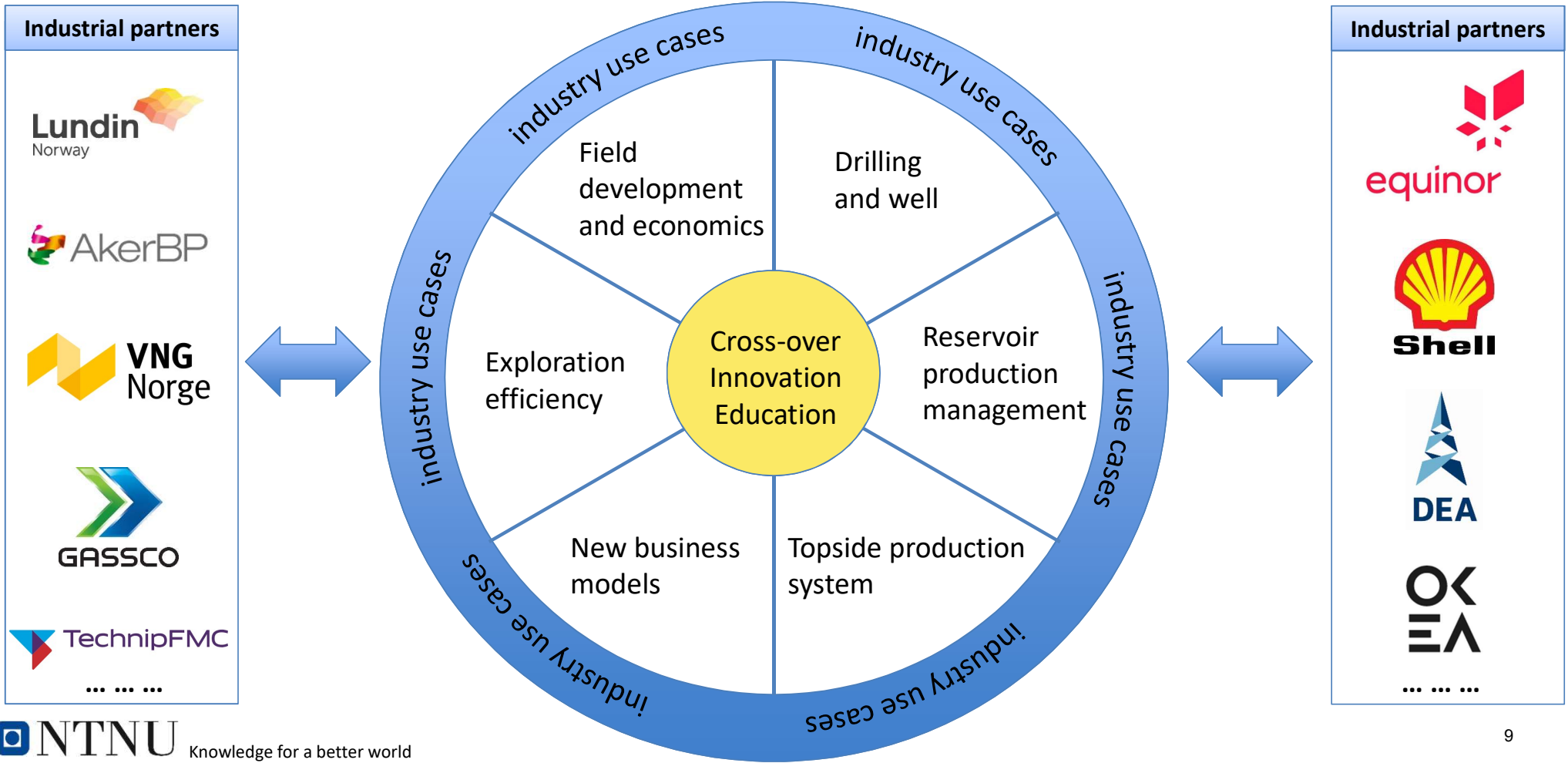


# Bridge between Petroleum Engineering & Digital and Automation





# BRU21 Innovation Model – 40 PhD/PostDoc



# BRU21 Science Management Team

- ❖ **Prof. Alexey Pavlov**, BRU21 program manager, Petroleum Cybernetics
- ❖ **Prof. Ole Morten Aamo/Prof. Lars Imsland**, Cybernetics & Automatic control
- ❖ **Prof. Eric Monteiro**, Computer Science
- ❖ **Prof. Sokratis Katsikas/Prof. Stephen Wolthusen**, Cyber Security

- ❖ **Assoc. Prof. Milan Stanko**, Production Technology & Field Development
- ❖ **Prof. Sigbjørn Sangesland**, Drilling and Well, Subsea Engineering
- ❖ **Prof. Jon Kleppe / Assoc. Prof. Carl Fredric Berg**, Reservoir Engineering
- ❖ **Assoc. Prof. Kenneth Duffaut**, Geophysics

- ❖ **Prof. Jørn Vatn**, Reliability, Availability, Maintenance and Safety

- ❖ **Prof. Per Morten Schiefloe**, Organization of digitalization and innovation
- ❖ **Prof. Asgeir Tomasgard/Prof. Stein-Erik Fleten/ Assoc. Prof. Verena Hagspiel** Industrial Economics and Technology Management

- ❖ **Dr. Arild N. Nystad**, BRU21 coordinator



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Lars Imsland



Erik Monteiro



Sokratis Katsikas



Stephen Wolthusen



Milan Stanko



Sigbjørn Sangesland



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Jørn Vatn



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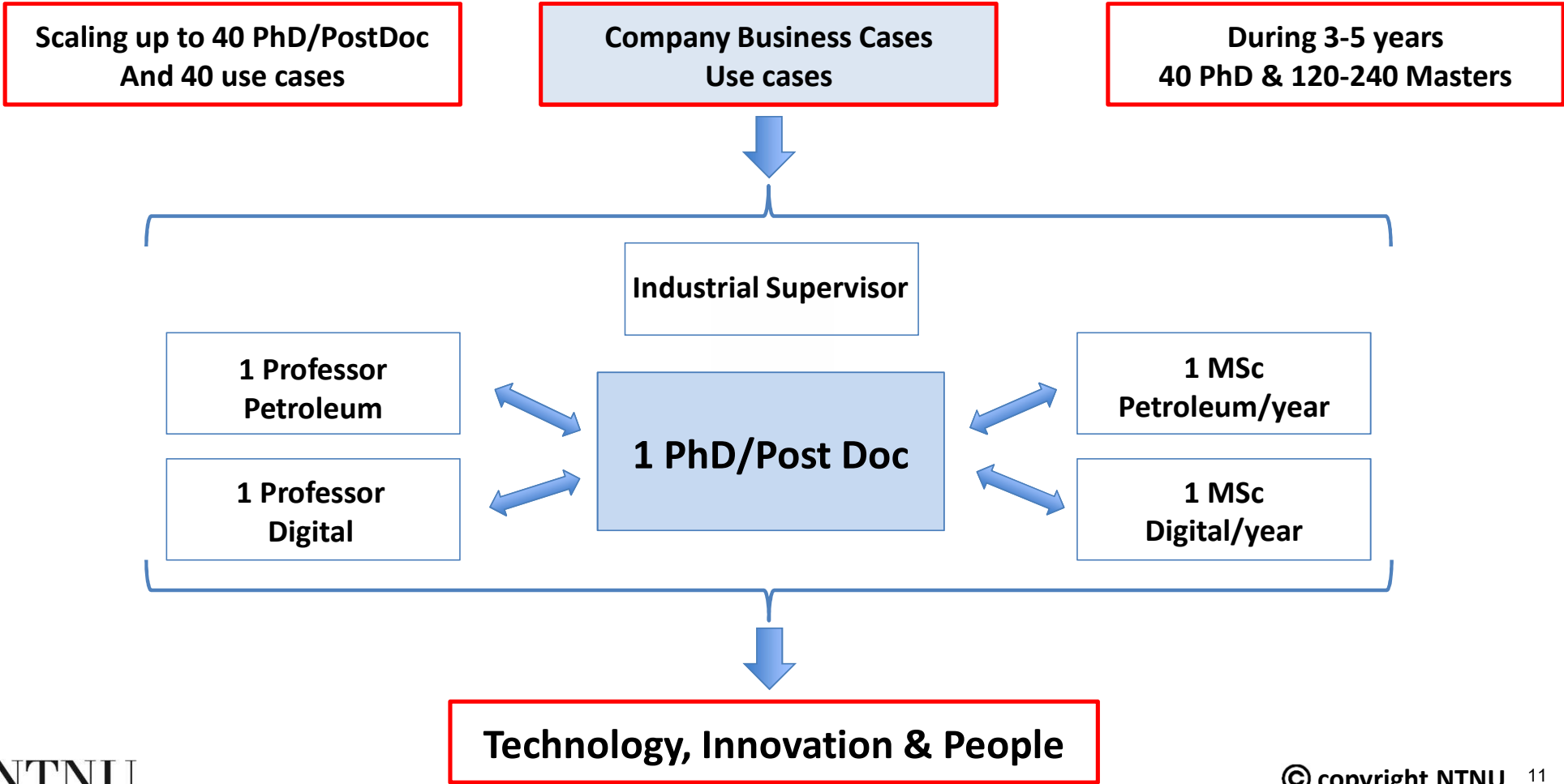


Verena Hagspiel



Arild Nystad

# Innovation team on each use case





# Digital and Automation Solutions

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