

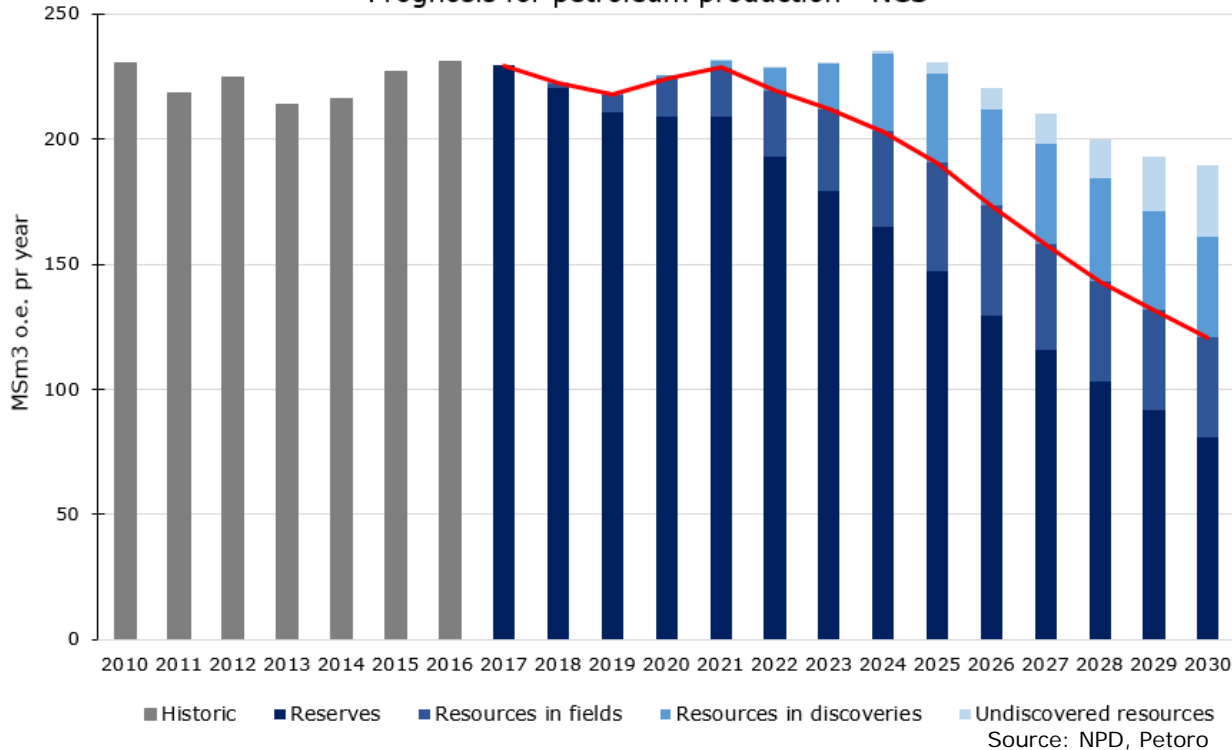


The way forward

NTNU BRU21, Better Resource Utilization in the 21st Century
Roy Ruså, Vice President Technology, Petro AS

Large potential – dependent on competitive business opportunities

Prognosis for petroleum production - NCS

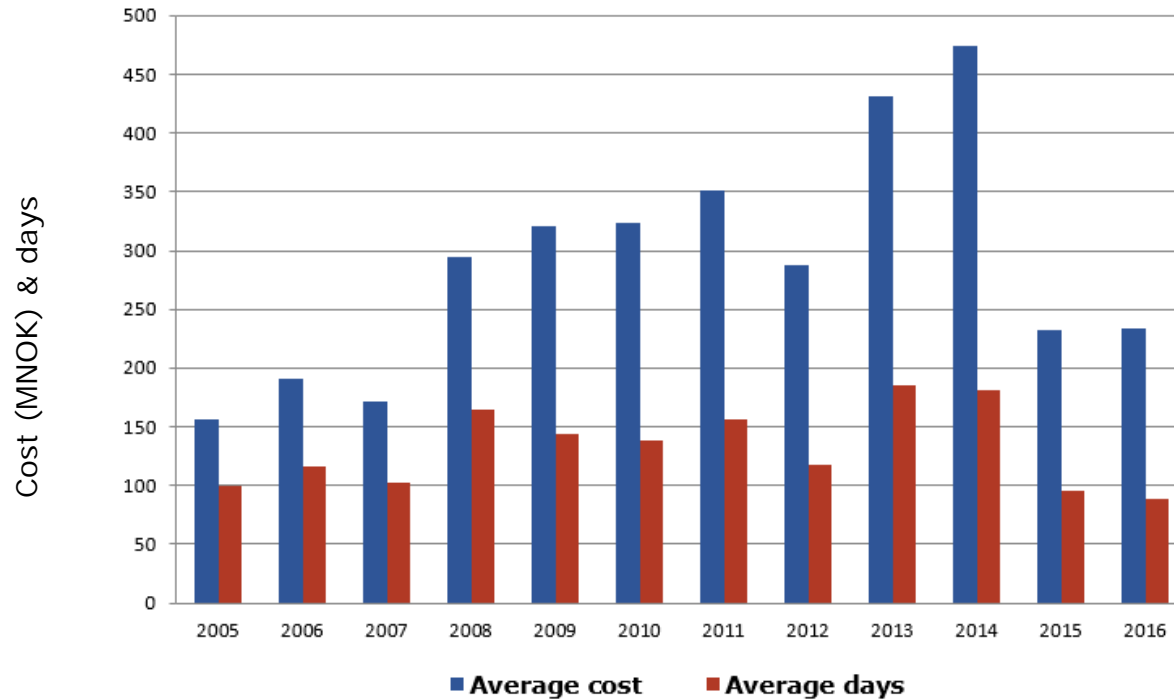


Good HSE

- Cost efficiency
- Reduce subsurface uncertainty
- Healthy supply chain

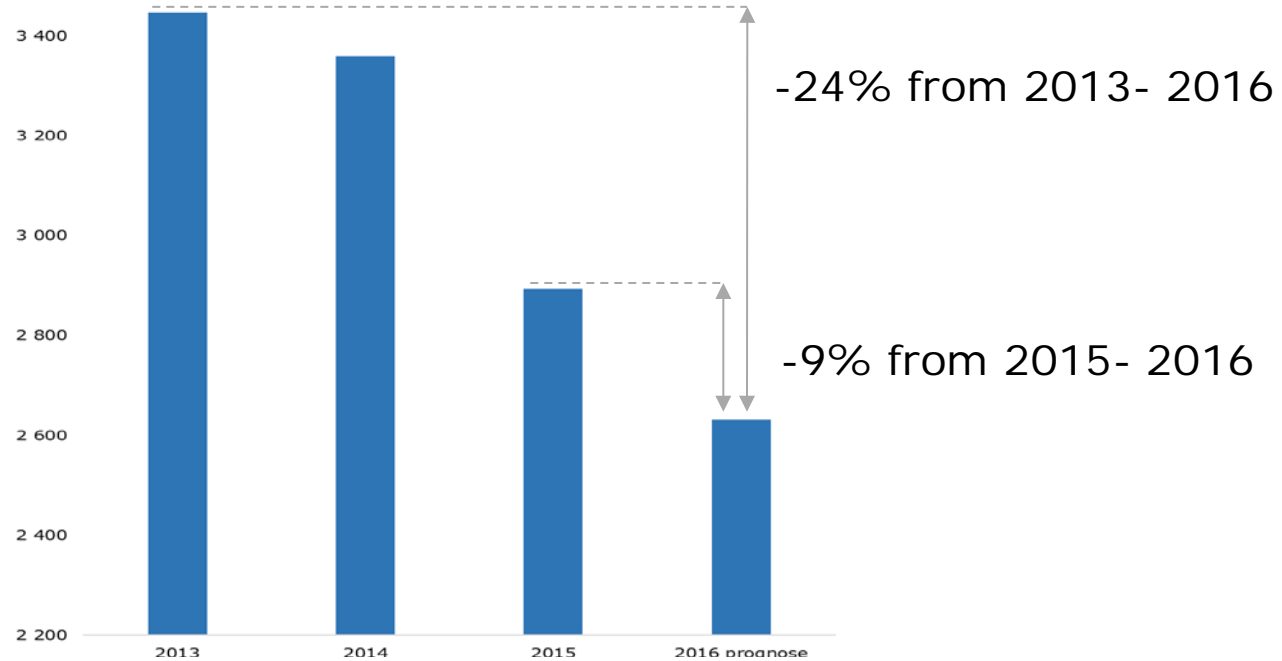
Well costs and time halved from 2014 to 2016

10 fixed installations in five major, mature oilfields in the SDFI portfolio

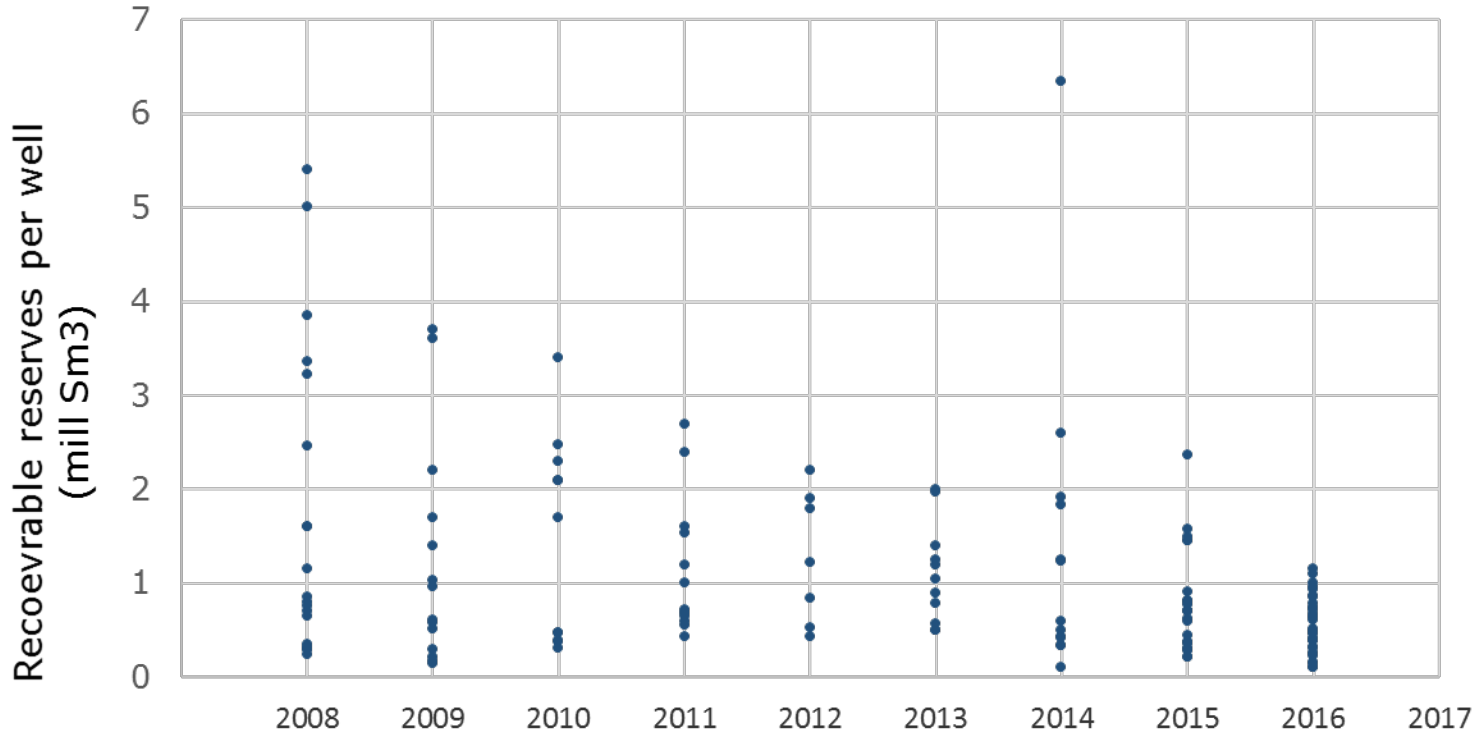


Opex reduced with 24%, 280 mill USD, since 2013 in five major fields

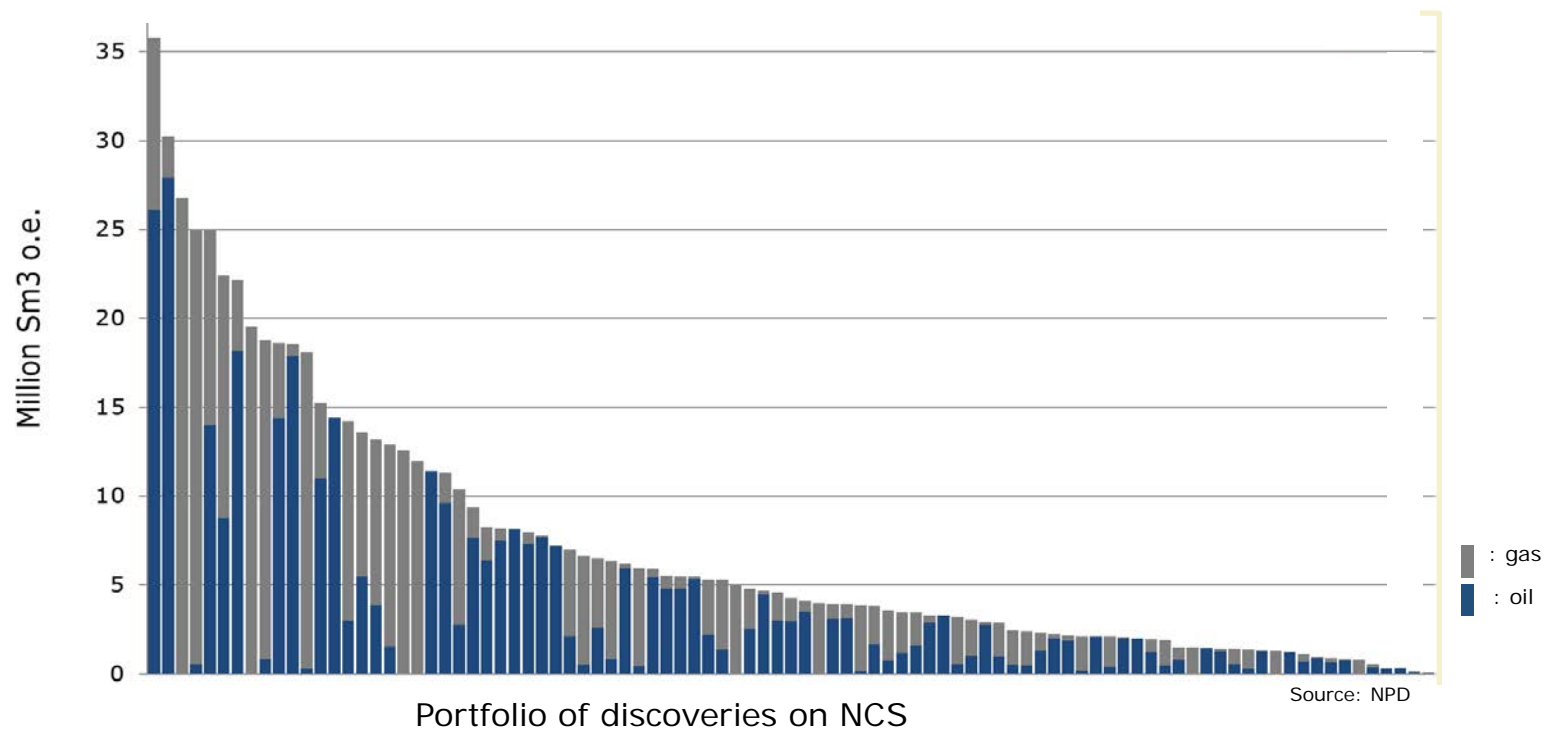
Field cost five major fields



Need for more: Recoverable reserves per well declines (example, five large, mature fields)



Need for more: The "bank" of discoveries on the NCS are generally "small"



Early wins delivered

- Improved cash flow
- Quarterly results



- Simplification
- Best practices
- Planning
- Performance measurement
- Renegotiating of rates

Strong cost increase



Only innovation will deliver radical change

Strong cost increase



- Improved cash flow
- Quarterly results

Early wins

- Simplification
- Best practices
- Planning
- Performance measurement
- Renegotiating of rates

- Radical goals
- 2-5 year horizon

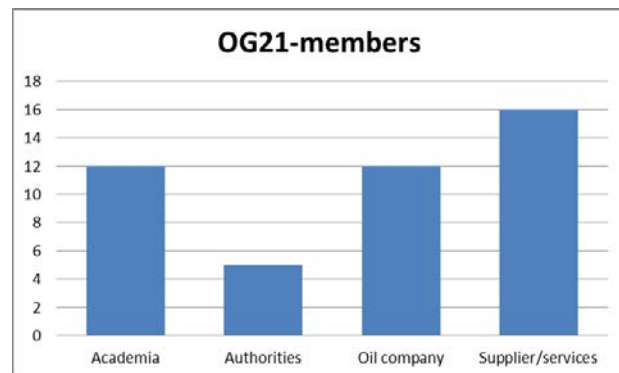
Transformation

- New technology
- Co-operation culture and co-operation forms
- Industry cooperation

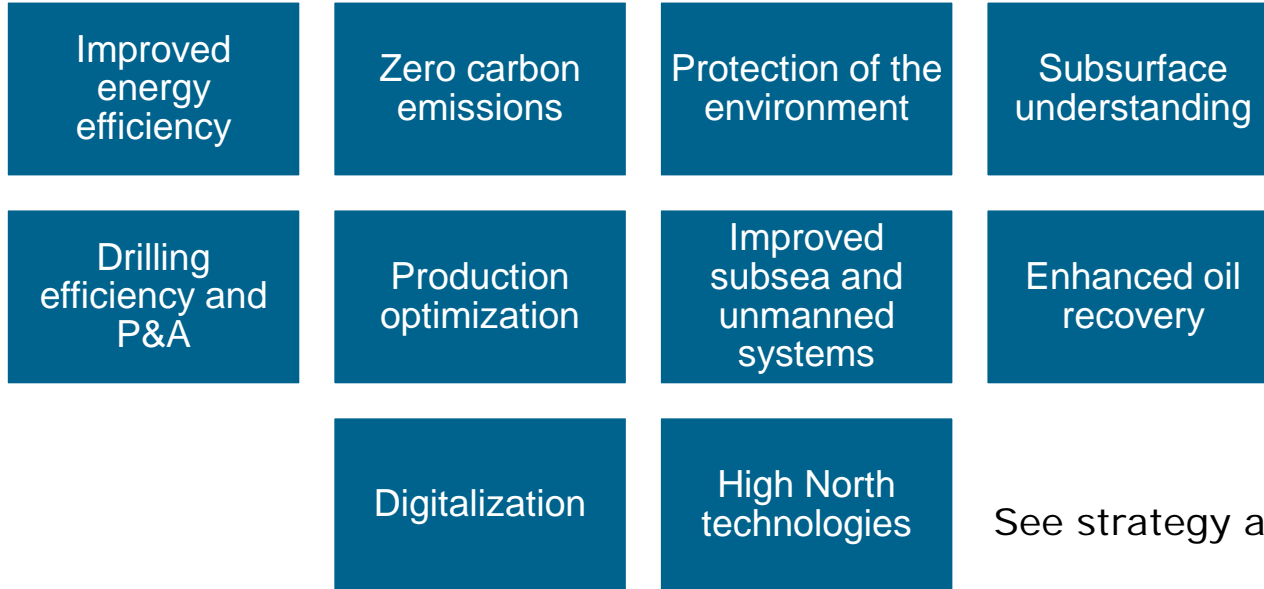
Improved competitiveness



OG21 – THE NATIONAL TECHNOLOGY STRATEGY FOR THE PETROLEUM INDUSTRY



PRIORITIZED TECHNOLOGY NEEDS



See strategy at www.og21.no

Details provided under each technology group (TTAs)

Digitalization - a necessity for doing business in the future

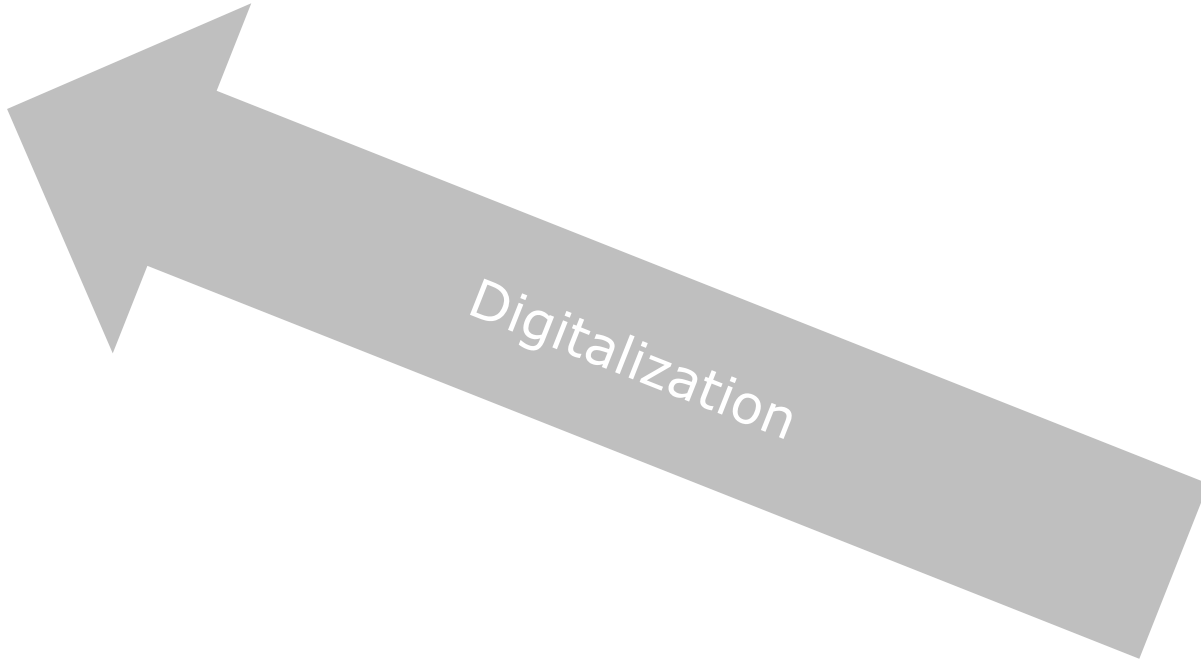


Drivers for faster implementation:

- Market drive
- Availability and maturity of key technology elements
- Good field examples
- Strategic programs in key oil and gas companies
- New business models on its way

"Digitalization" – a vague and undefined term

Reduce well
costs

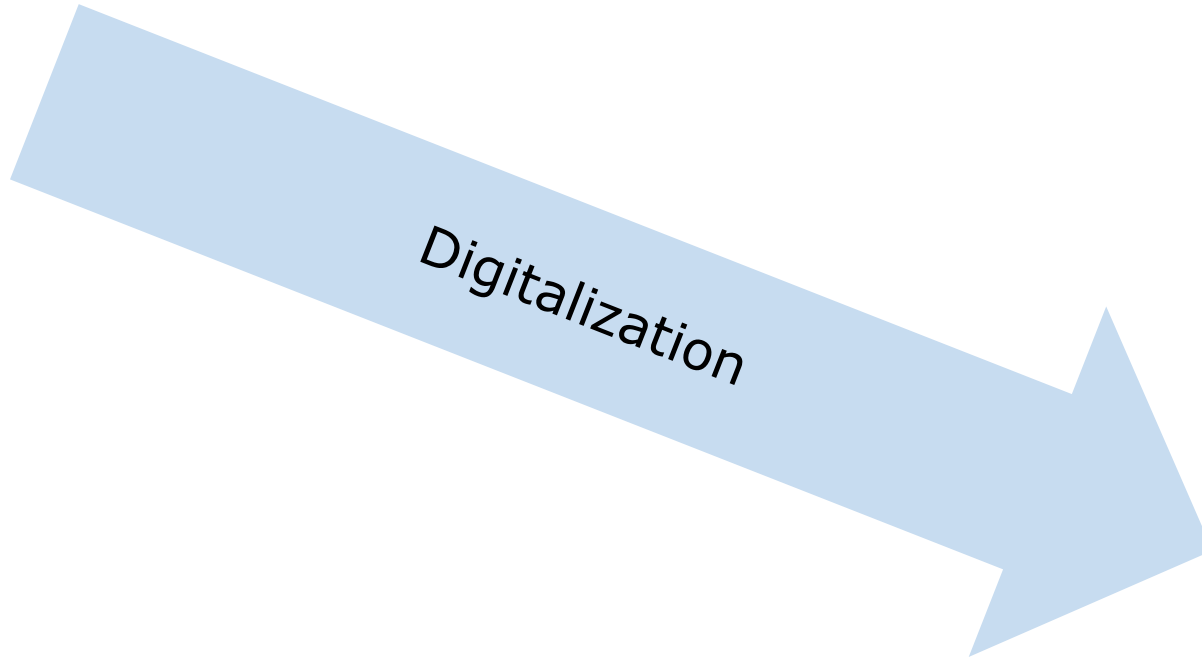


DATA:

- Real time
- Historical
- Structured
- Unstructured

"Digitalization" – it starts with the problem

Reduce well
costs

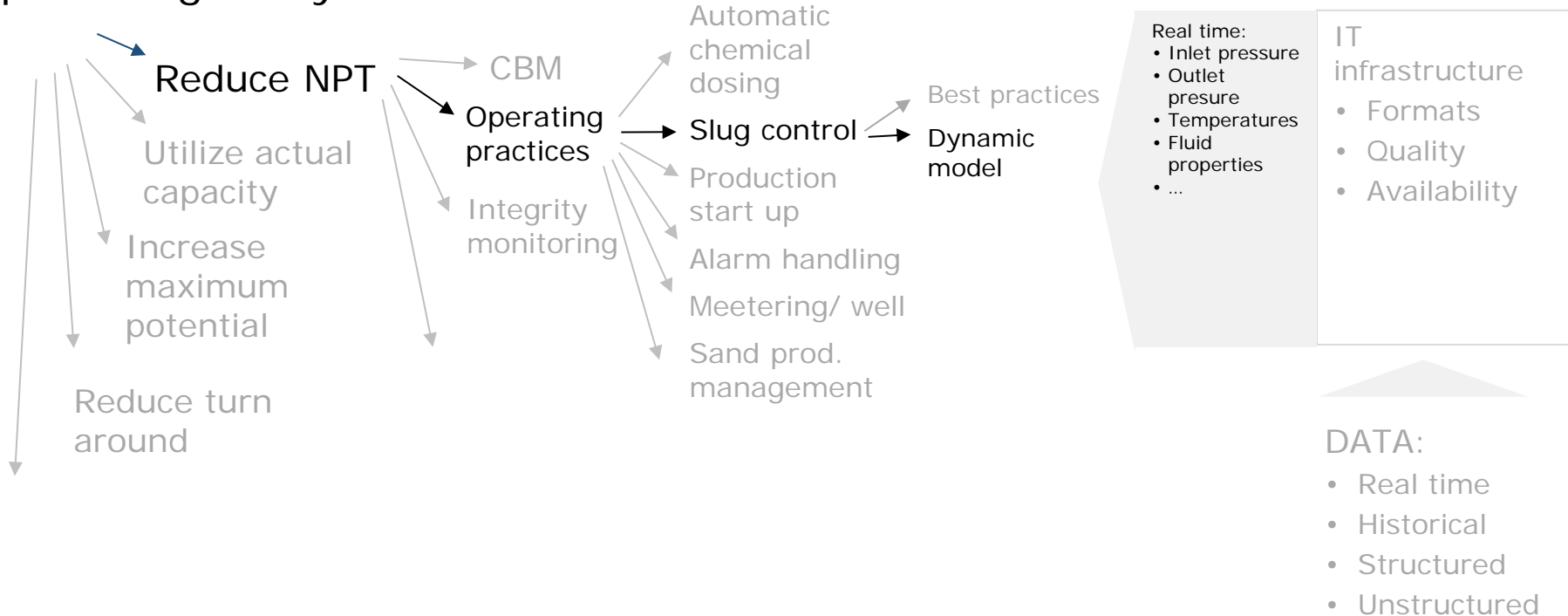


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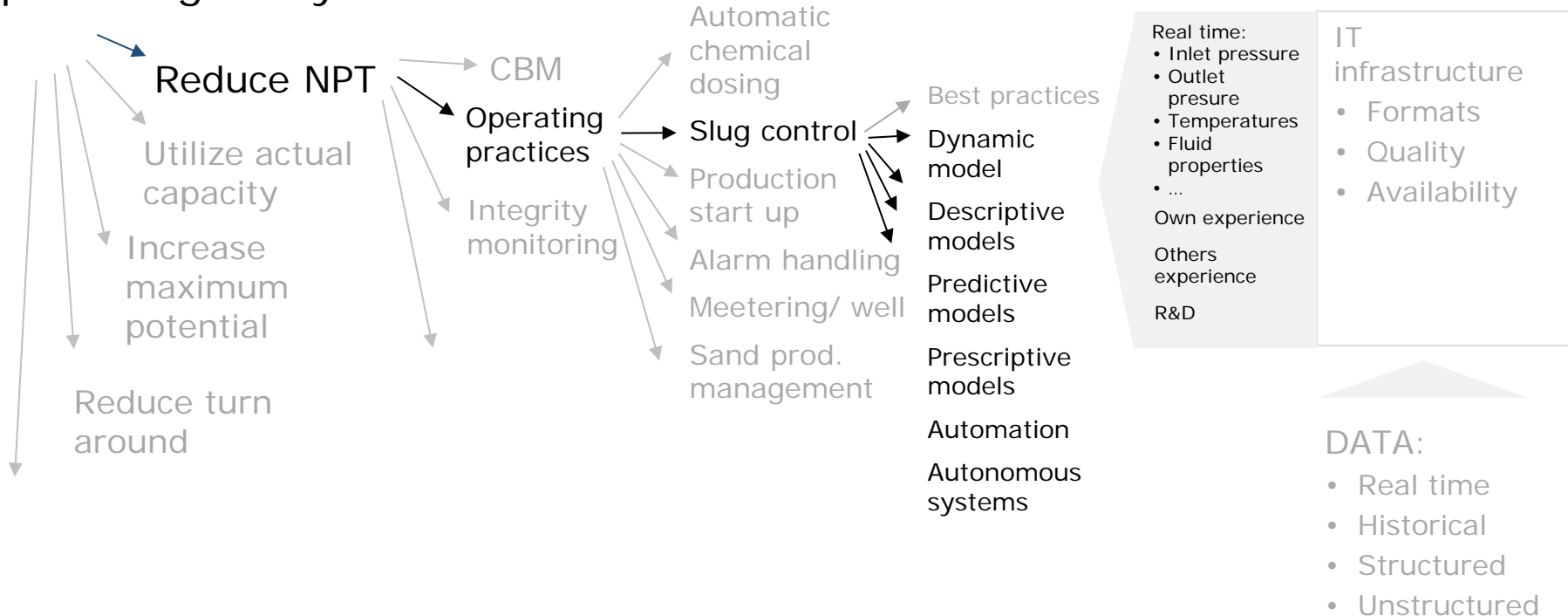
The ~~devil~~ is in the ~~details~~ ... heaven data

Improve regularity

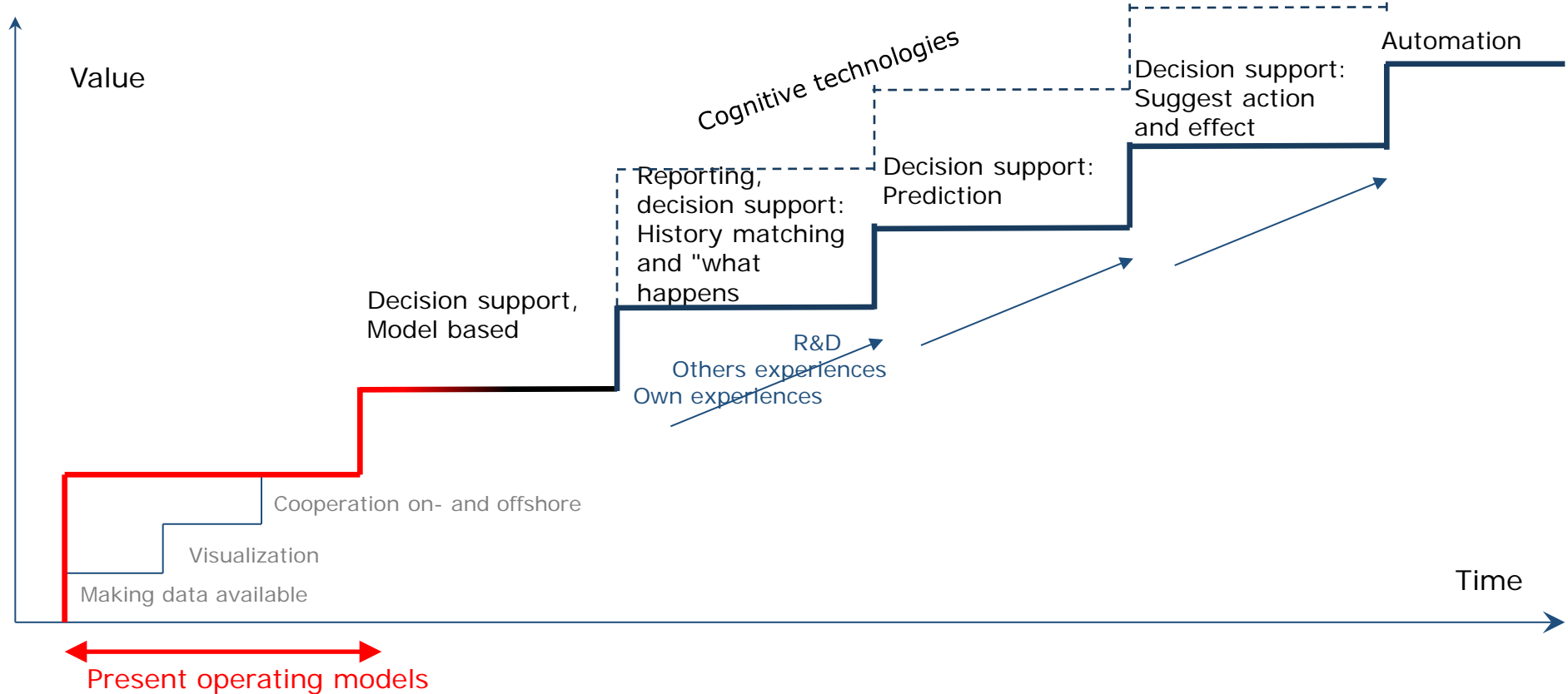


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Improve regularity

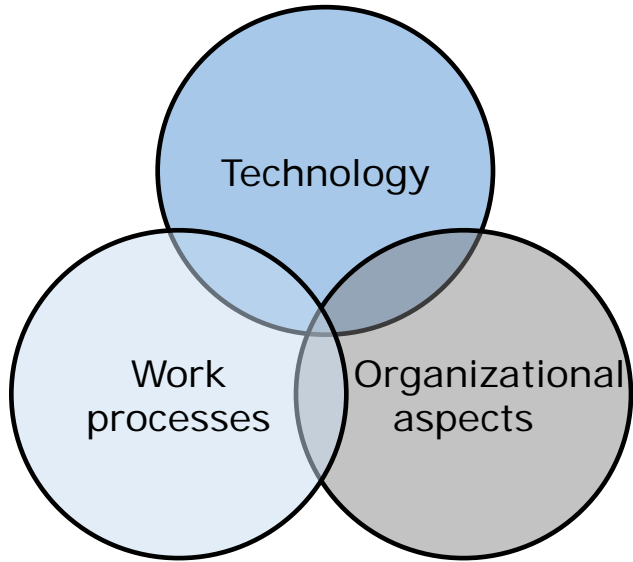


The road map



The way forward

Realization of the value potential are contingent on work processes and organization-specific factors



Factors include:

- The degree of executive sponsorship, support and accountability
- A "translator" appointed to manage and coordinate between operations, technical disciplines, IT and procurement
- Willingness to experiment, pragmatic approach to business plan, but measuring performance for continuous improvement
- A focused and "purpose built" redesign of work processes
- Co-operating across companies

"Sharing anxiety"

What can we co-operate on?

What shall we compete on?

Culture defines "co-operation"



- Prescriptive/ requirement – "do what i say..."
- Formal/ measuring on the bottom line
- Communication/ information exchange
- Joint problem solving
- Flexibility
- Avoid use of power

Continued innovation creates winners

Project competitiveness = NCS competitiveness = Supplier competitiveness

