Integrated Operations Generation 2

- Potential and opportunities for the oil and gas industry

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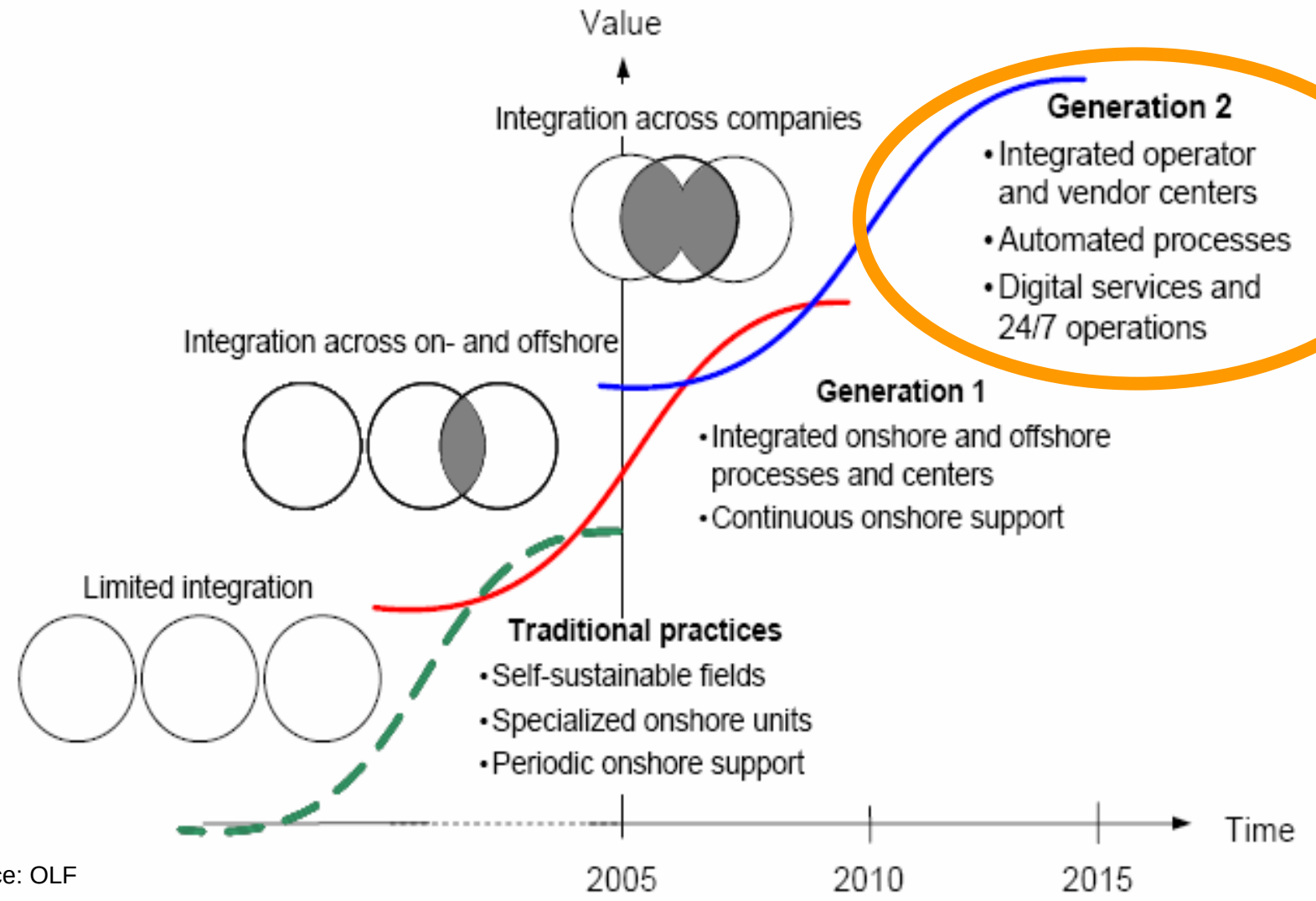
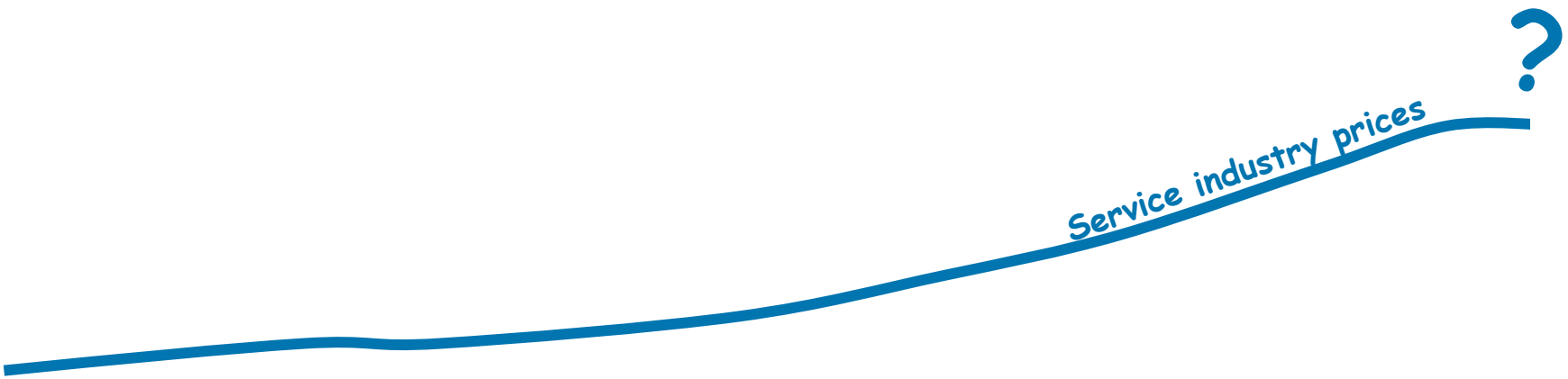

Value
Integration across companies
Generation 2
• Integrated operator and vendor centers
• Automated processes
• Digital services and 24/7 operations
Integration across on- and offshore
Generation 1
• Integrated onshore and offshore processes and centers
• Continuous onshore support
Limited integration
Traditional practices
• Self-sustainable fields
• Specialized onshore units
• Periodic onshore support
Time
2005
2010
2015

Source: OLF

CEO Helge Lund on Integrated Operations

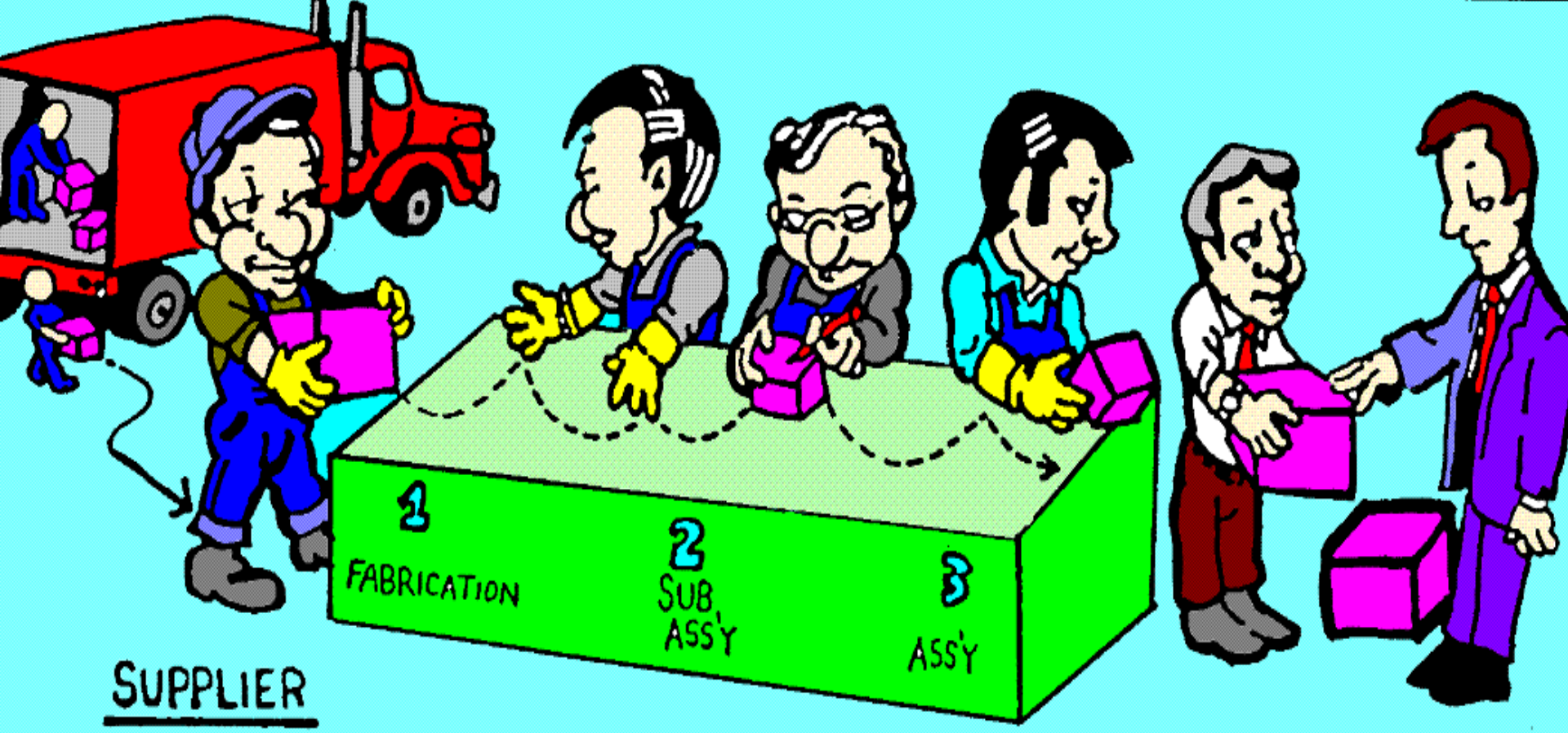
-Intelligent Energy Conference, Amsterdam February 2008

- StatoilHydro's vision is to be leading within integrated operations by networking competences globally. In practical terms, this means to develop a global competence network by leveraging our integrated operations. It means that we will continue to remove boundaries between our people by applying new technology and new work processes. But most importantly, it means that all our fields and facilities should be compliant with our way of collaborating.
- Future success will depend on our ability to leverage our hard earned skills and experience from the NCS. More than ever it will be important to integrate our own employees, suppliers, experts and technology. New work processes and interaction within integrated operations mean that we can improve the use of our resources, and at the same time enhance quality.


Service industry prices
?

Example: Supply chain management

- Standardization refers to approaches for increasing commonality of either:
  - Parts
  - Process
  - Product
  - Procurement
- Such change will enable:
  - Faster procurement decisions
  - Faster Manufacturing
  - Reduced variability
  - Lower prices
  - Reduced stock need



THE ULTIMATE FACTORY

- BALANCED
- SYNCHRONIZED
- SIMPLIFIED
- WASTE FREE
- RATIONALIZED

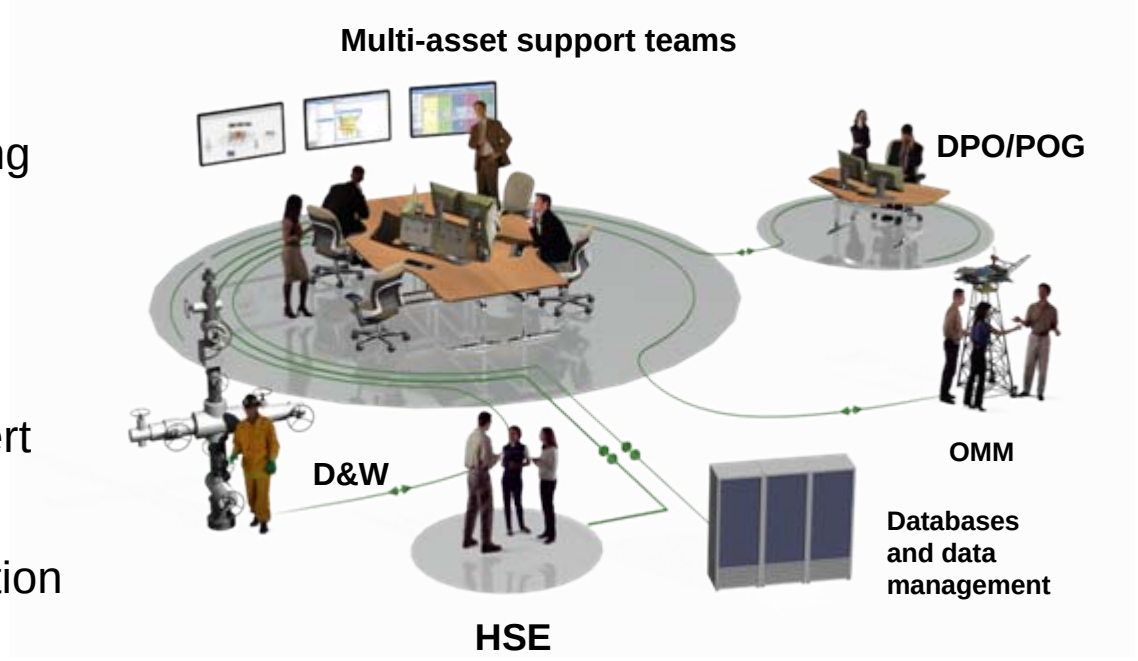
Integrated Operations in StatoilHydro

IO is the integration of people, process, and technology to **make and execute better decisions quicker**. IO is enabled by the use of real time data, collaborative technologies, and multidiscipline workflows.

Efficient use of IO enables:

- Improved knowledge sharing and experience transfer
- Contribute to common and consistent performance
- Improved utilization of expert personnel

independent of geographical location



Some implications from the use of IO

- There will gradually be new requirements to increased opening hours and availability
- Some suppliers of equipment will be required to perform remote monitoring, diagnostics and assistance to the offshore organization from their own location instead of sending people offshore
- New requirements to mobile drilling rigs (IT, Communication, Collaboration facilities)

- Requirements to deliver data in standardised formats (PRODML) and with specified availability requirements (SLA)

OLF: *An efficient pipeline for real-time data transferal and analysis*

Field data

- Health, safety, environment
- Seismic
- Drilling & Completion
- Reservoir & production
- Operation & maintenance

ISO 15926

Source: OLF

Smarter solutions

Web portals
Web services

Common XML schemas

Semantic Web

- Infrastructure for web services
- Oil & Gas Ontology

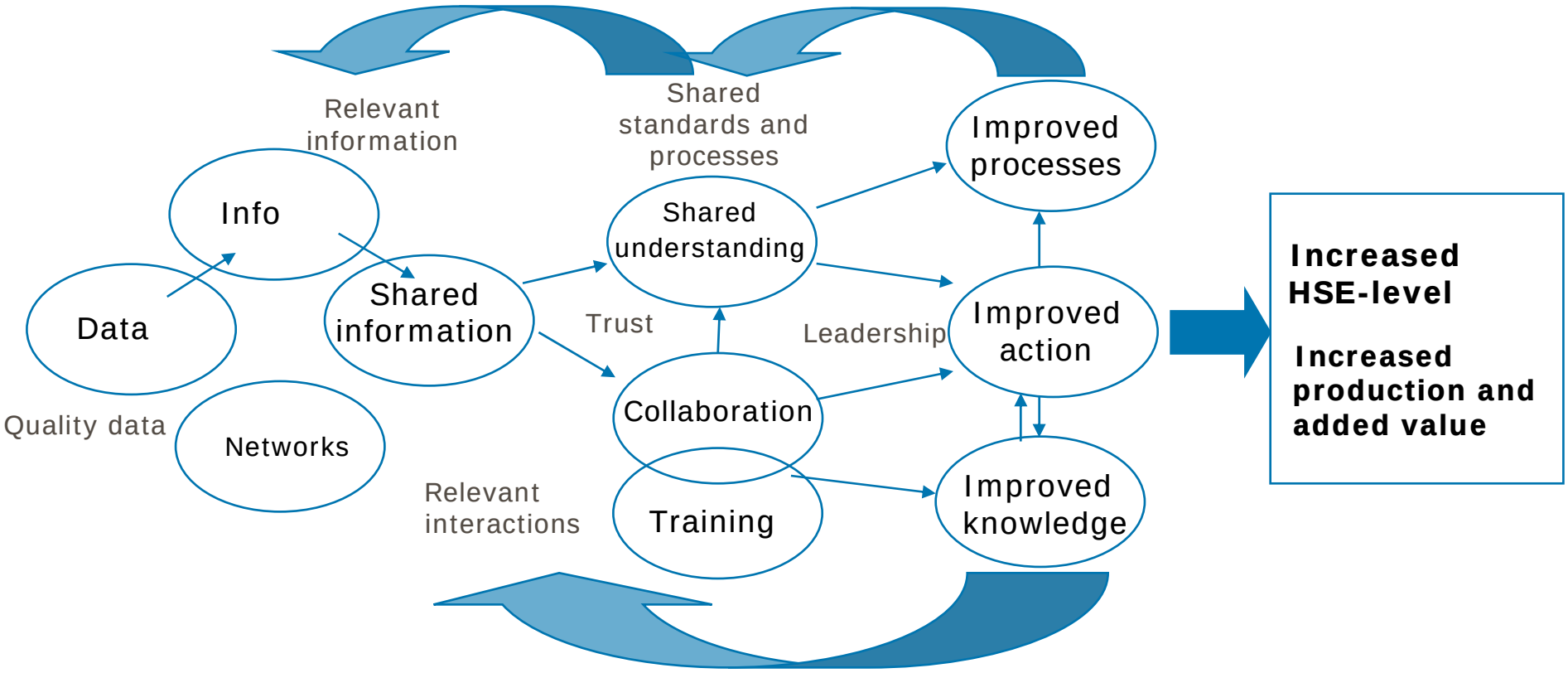
Smarter data

Vendor

Operator

Vendor

Taking the value out of semantics and the ontologies



IOHN: Main Objectives

- The primary objective of the project is to develop:
  - A demonstrated reliable digital platform for Integrated Operation Generation 2 (IO G2) in the High North
  - IO G2 pilots within drilling, R&P, O&M in the High North
  - Decision Support for drilling, R&P, O&M
- IO G2 for the High North shall facilitate operations in remote and hazardous conditions, the use of limited operational personnel and “zero footprint” solutions

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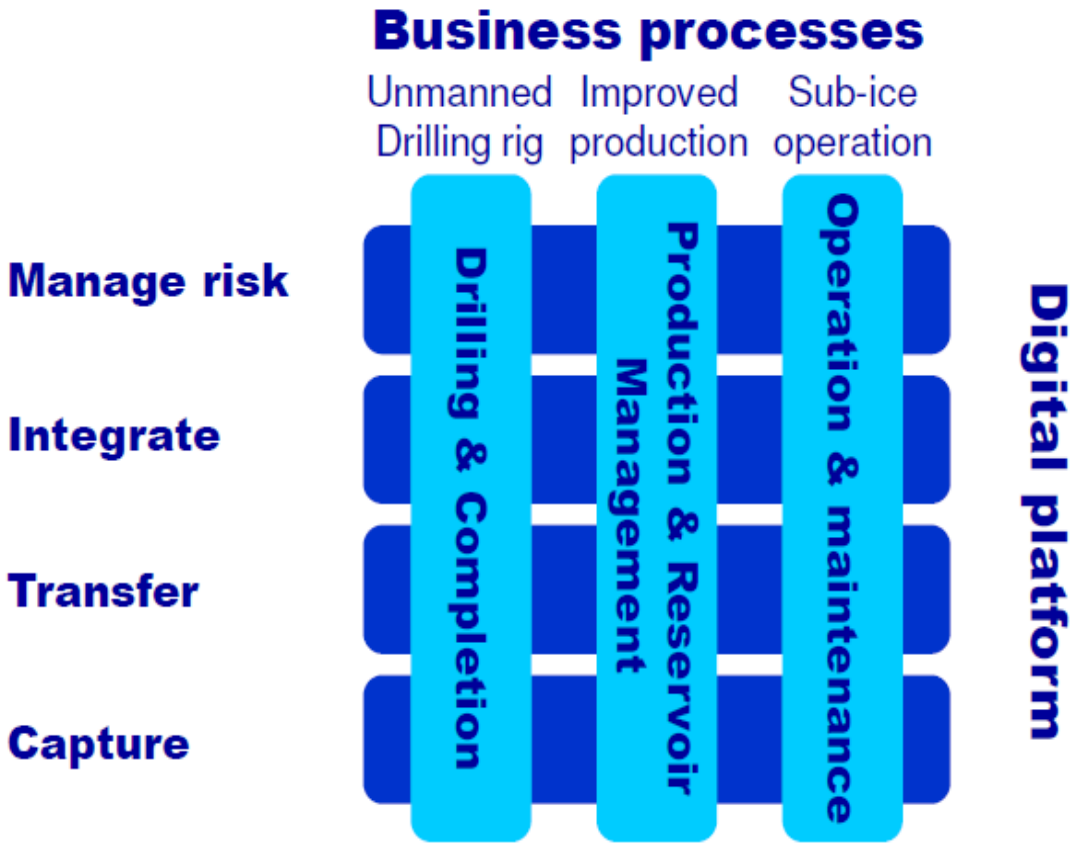
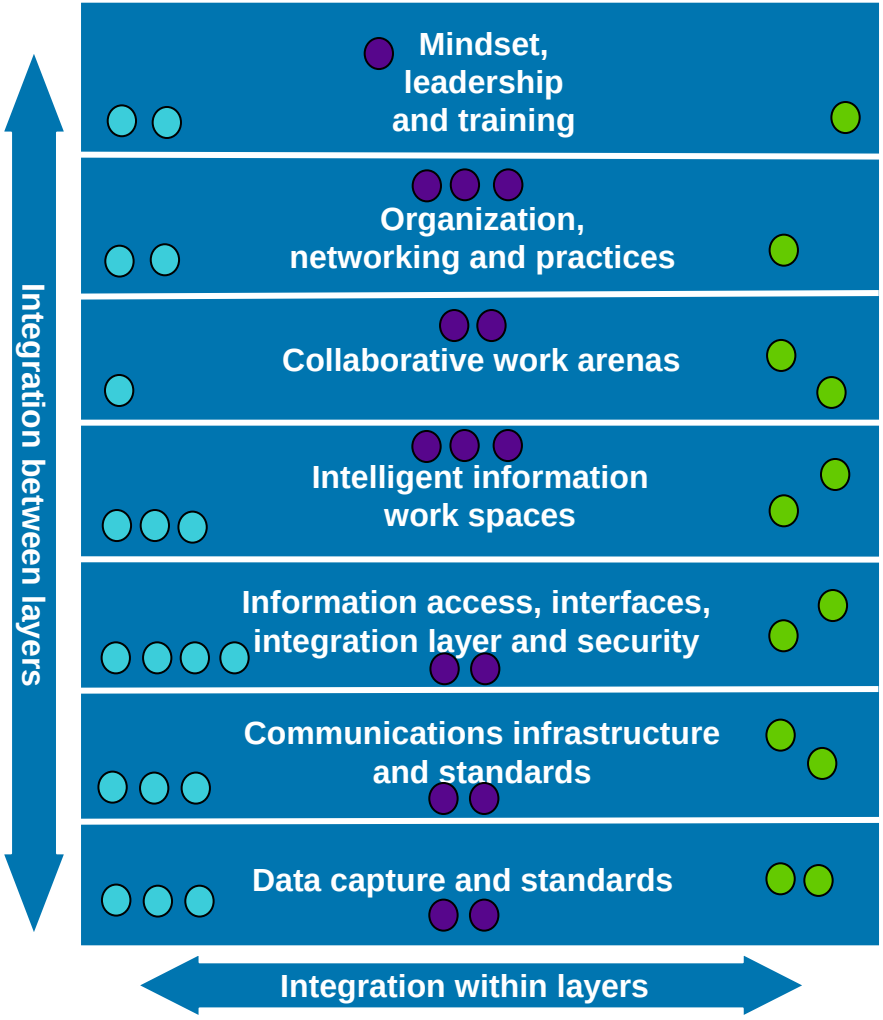
IOHN: Success factors

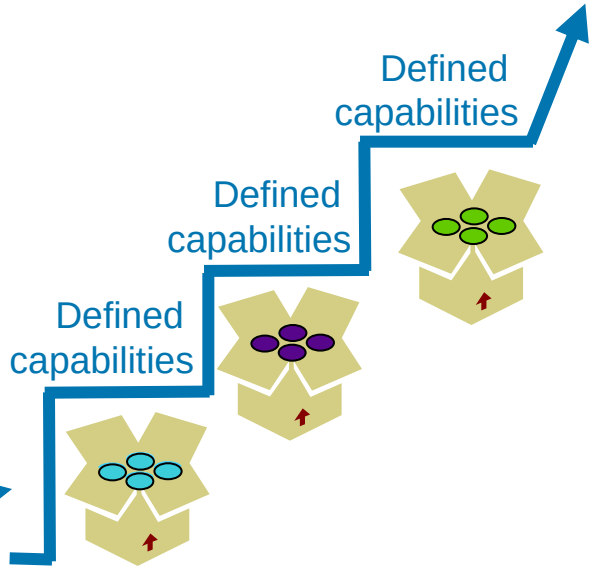
- Success of IOHN depends on the ability to have a close link between the pilots and the generic activities
- Prototyping and testing in real cases supported by domain knowledge
- Tight communication between pilots so that existing silos are challenged

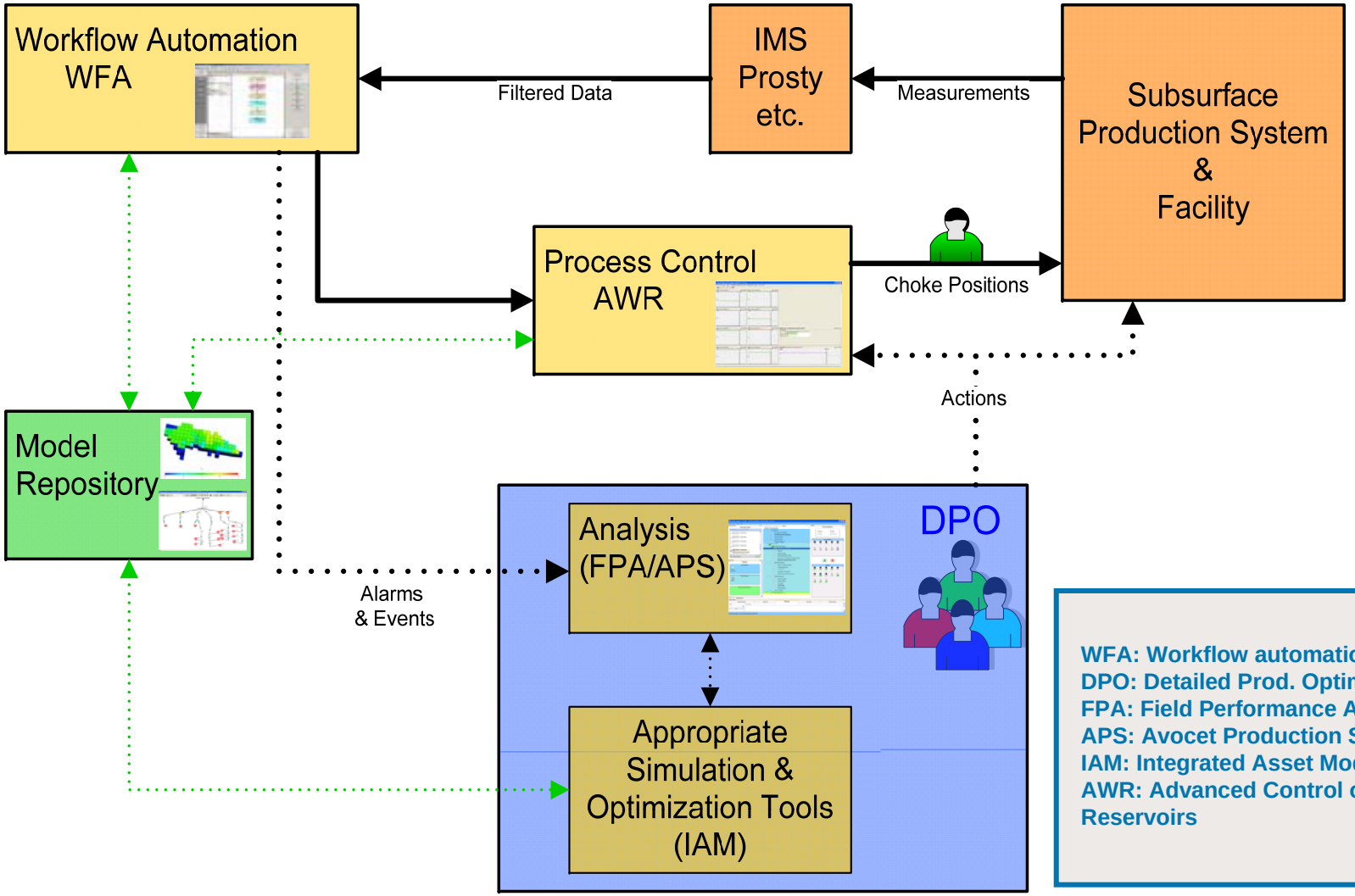


From Architecture to capabilities



Integrate and combine elements into packages and implement them in such a way that we operate differently to achieve our objectives





WFA: Workflow automation
DPO: Detailed Prod. Optimisation
FPA: Field Performance Analyser
APS: Avocet Production Surveillance
IAM: Integrated Asset Modeller
AWR: Advanced Control of Wells and Reservoirs

- IO is more information in real time offshore and onshore
- IO is safer, faster and better decisions
- IO has a potential of NOK 300 billions on the NCS

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