

Digital transformation in Oil & Gas: pros and cons

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Process automation

- Creating value in the processes for an internal (worker) or external customers via a software solution that runs unattended, working like a virtual employee with legacy applications performing repetitive tasks reliably at the UI level



Performance improvement

- Creating value at the new frontiers of the business world with software-driven intelligence that mimics human cognition, behavior and thought processing to replicate more complex tasks that include professional judgment and historical knowledge

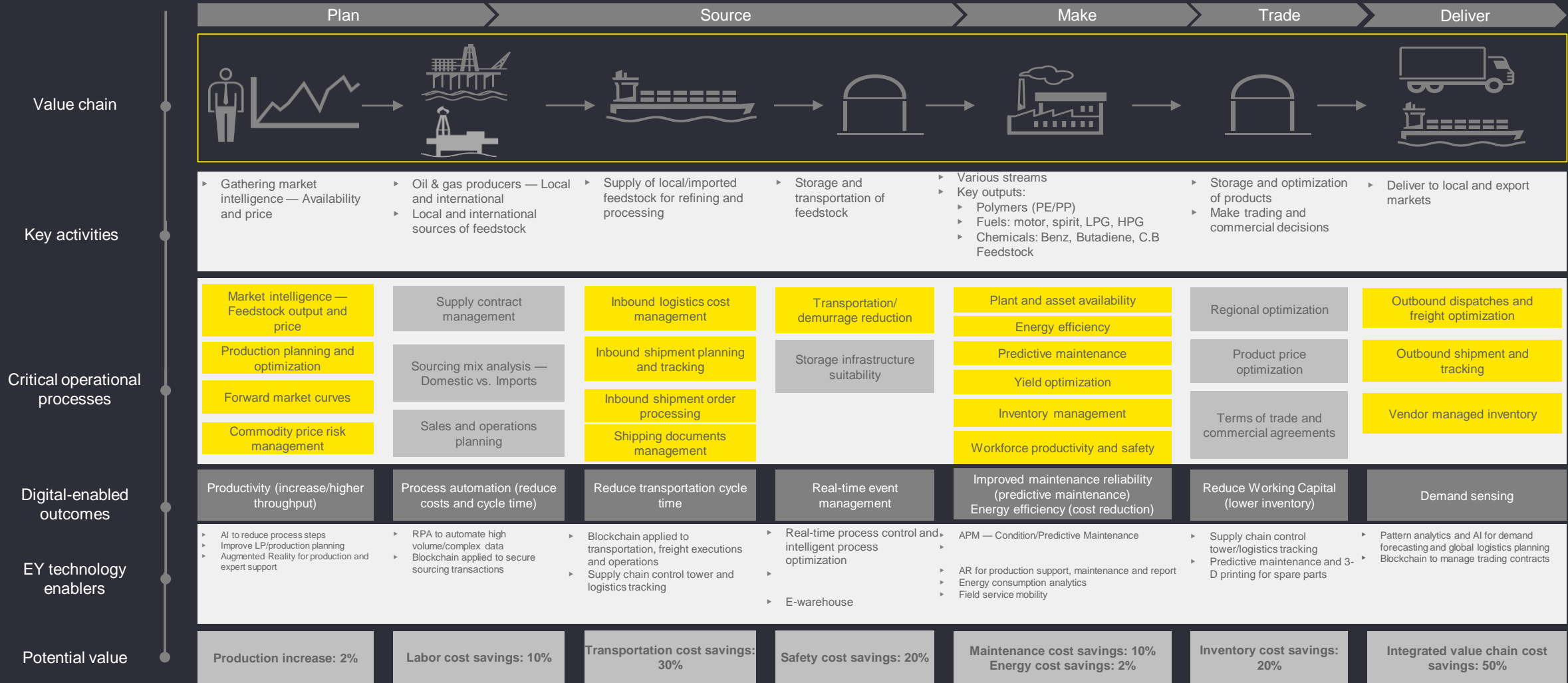


Transformation

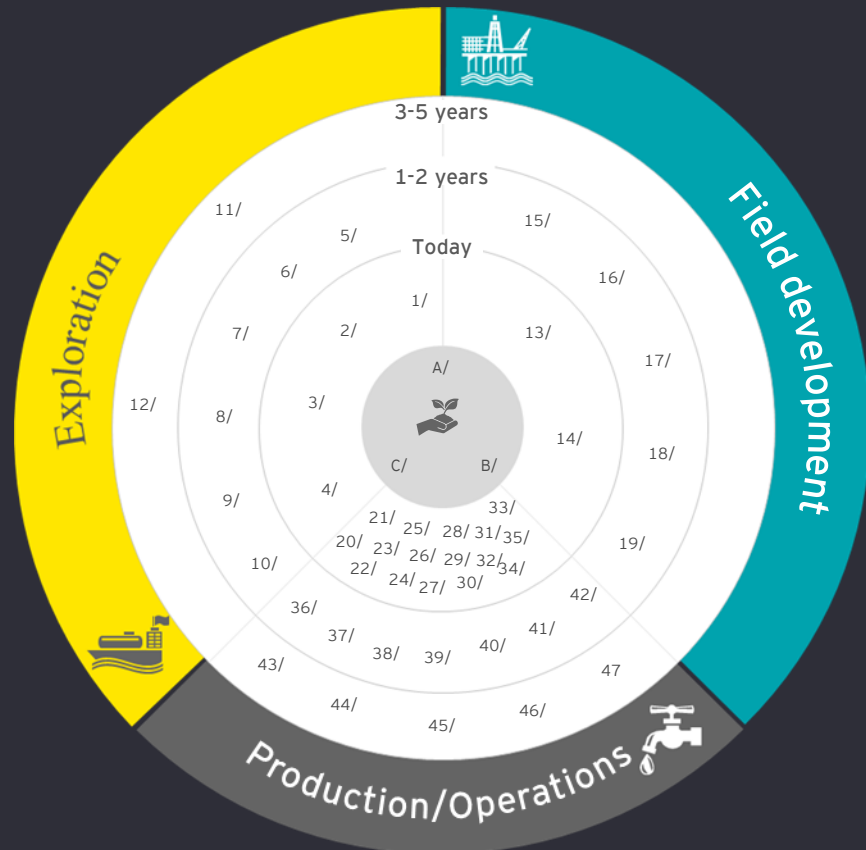
- Creating value across an entire structure or enterprise with technology, tools and architectures that – when combined – can automate an entire end-to-end process (i.e., customer backed supply chain)

Cost savings across the entire O&G value chain

Illustrative



Illustrative digital solution for Oil & Gas



A IT/OT cybersecurity

- Exploration**
- 1 Mobile applications used to monitor location and status of rigs
 - 2 Enterprise asset management for more efficient management of resources
 - 3 Process data historians to enable process data for business use and reporting
 - 4 Safety data from sensors
 - 5 AI used in data-rich processes to drive exploration efficiencies
 - 6 Robots perform drilling and pipe laying tasks
 - 7 Robots and sensors to quickly analyze surface and subterranean environments of potential drilling sites
 - 8 Autonomous field vehicles
 - 9 Real-time collaboration
 - 10 Cloud Mobile in use for exploration wells
 - 11 Automated prospect analysis through data integration
 - 12 Cloud event processing
- Field development**
- 13 Sensors used to monitor anomalies in equipment
 - 14 Sensors on rotating equipment
 - 15 Location intelligence
 - 16 Automated 3D printing processes used to develop tools for drilling and well development

B IT/OT integration & convergence

- 17 Utilizing real-time data to build optimized onshore and offshore earth models
 - 18 Mobile platforms used to remotely analyze exploration data, which drives well development decisions
 - 19 Crisis/incident management
- Production/Operations**
- 20 Real-time monitoring and data analytics to improve process safety
 - 21 Use of drones for land surveying and mapping, well and pipeline inspections
 - 22 Environmental (emissions) monitoring and control to monitor fuel gas
 - 23 Process control and industrial automation
 - 24 Process data historians
 - 25 Drilling and flow optimization using IoT from the drilling rigs, wells, completions
 - 26 Sensor data integrated with Enterprise Resource Planning
 - 27 Machine and sensor integration for real time process and mechanical supervision
 - 28 Workflow automation
 - 29 Energy consumption profiles for oil, gas and chemical production processes
 - 30 Operational digital oil field solutions for operational excellence
 - 31 Process control and industrial automation
 - 32 Increase well production through sensors and data analytics
 - 33 Sensors mounted on equipment to provide real time maintenance data

C Data governance

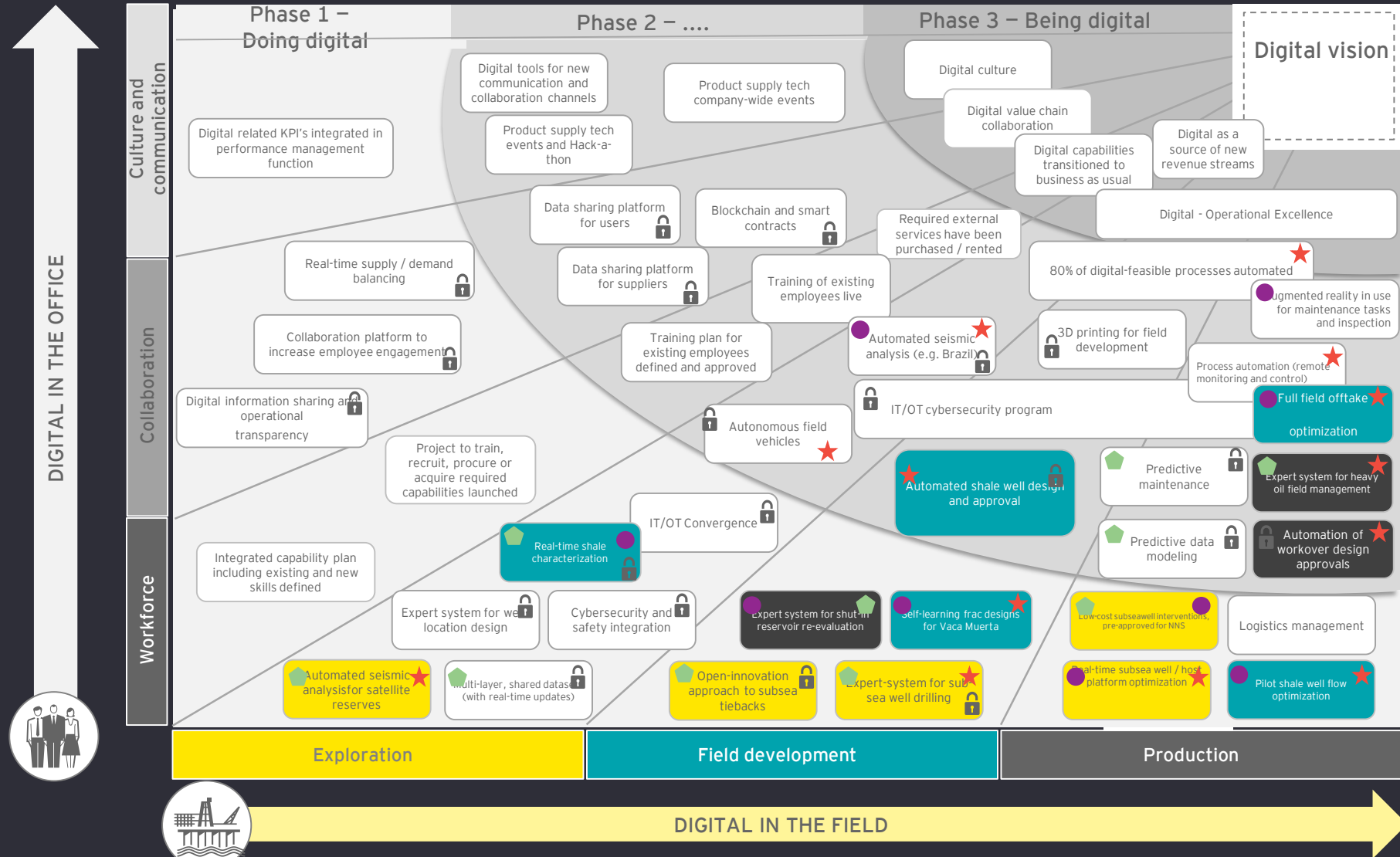
- 34 Predictive maintenance to increase mean time between failure
- 35 Pipeline and equipment monitoring
- 36 Augmented reality in use for maintenance tasks and inspection
- 37 Automatic updating of well models to dynamically vary production levels
- 38 Condition-based maintenance and predictive analytics improve non-productive time (NPT)
- 39 Remote operations using connected devices to optimize resource involvement
- 40 Real-time analysis of sensor data from reservoirs to optimize production
- 41 Operational intelligence for upstream
- 42 Hydrocarbon accounting platform
- 43 Wearable user interface
- 44 Augmented reality in use for maintenance tasks and inspection
- 45 Asset performance management
- 46 Integrated planning and operations
- 47 Mobility and remote operations

Illustration

360-degree view of transformation

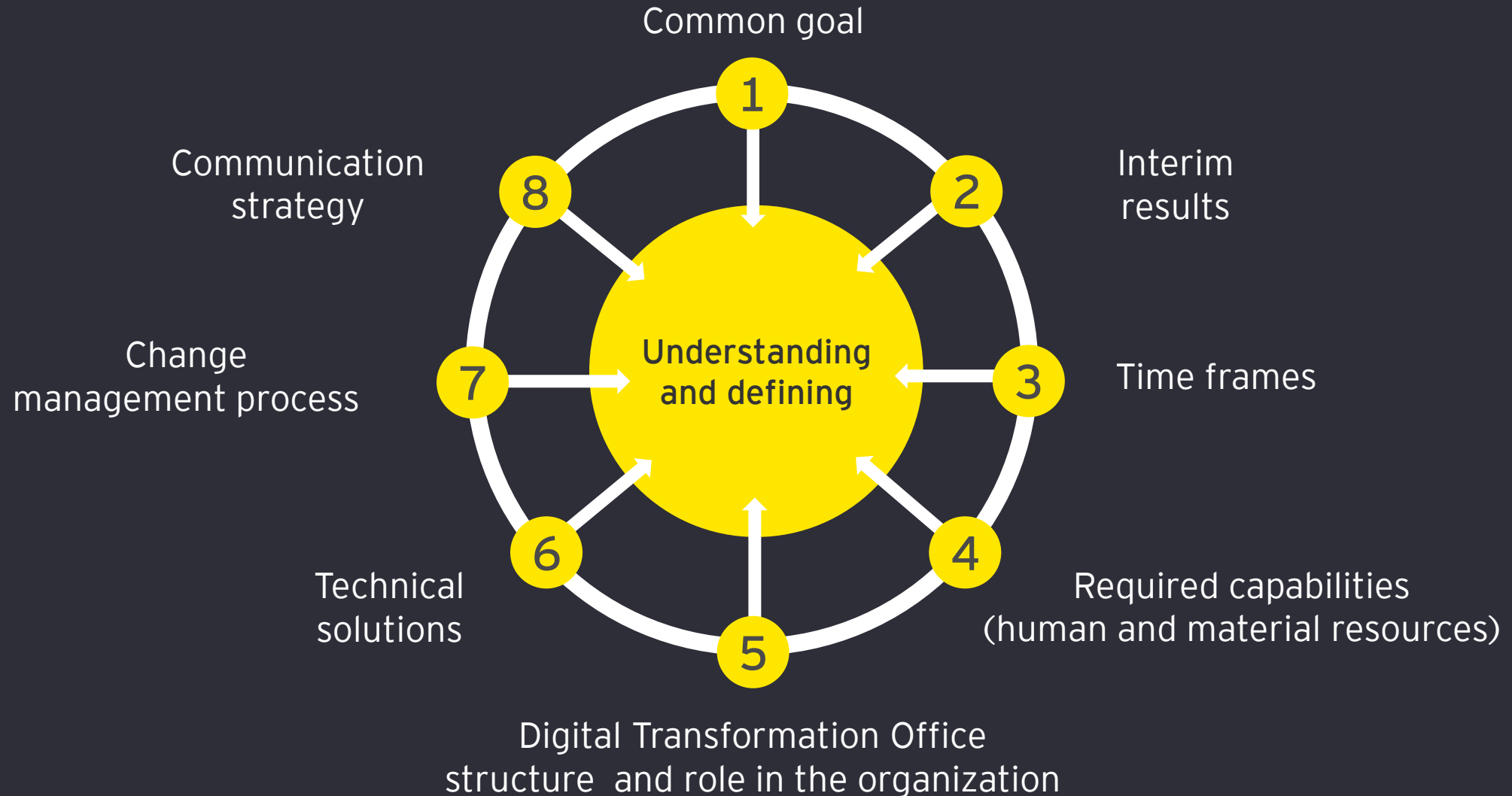


Most companies already have digital transformation road maps

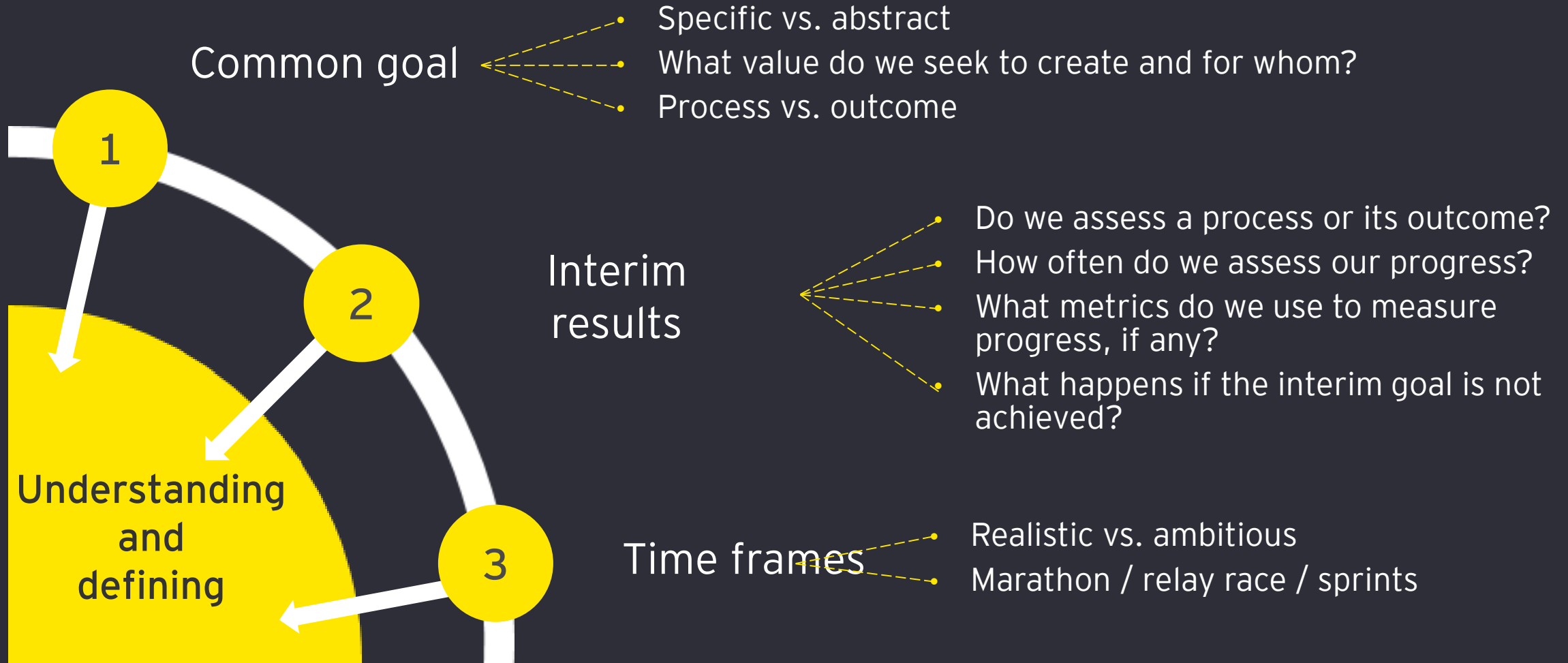


Successes and pitfalls of digital transformation (1/4)

Key drivers



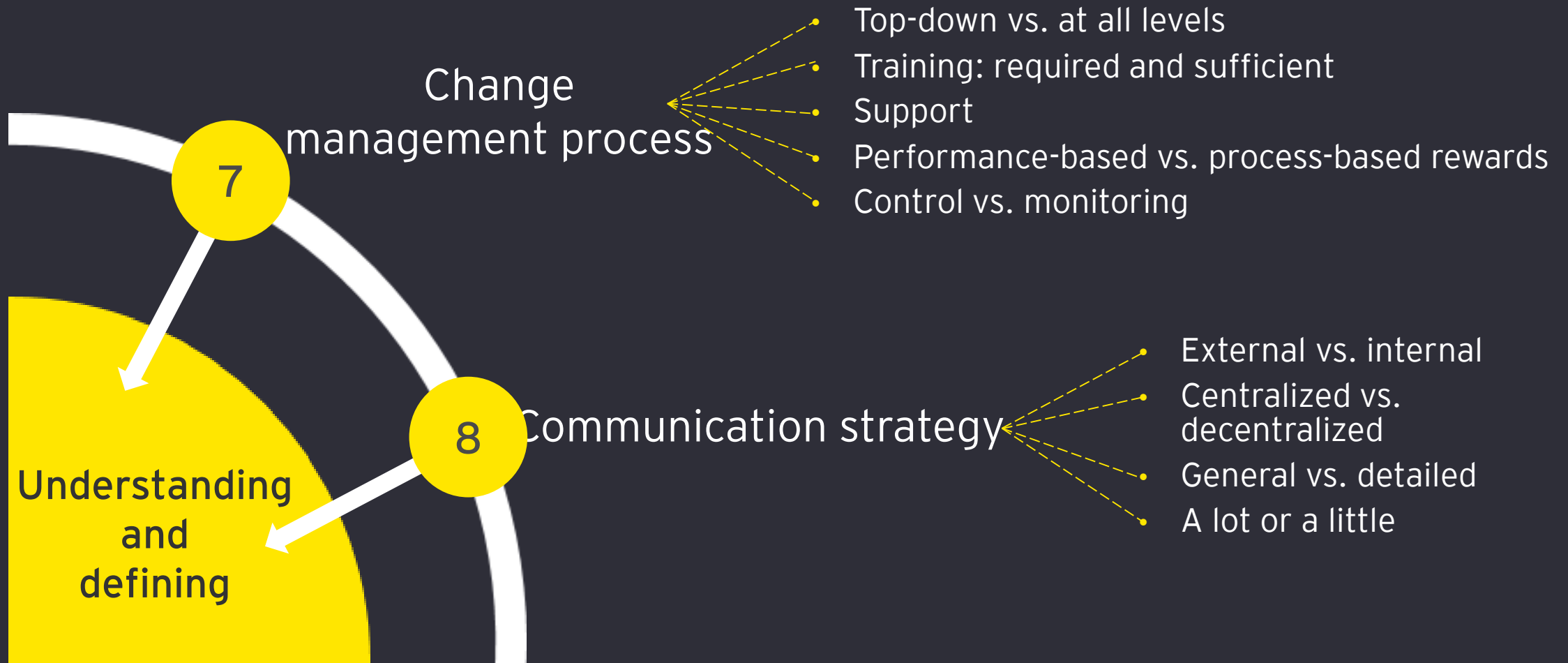
Successes and pitfalls of digital transformation (2/4)



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Successes and pitfalls of digital transformation (2/4)



Thank you!

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