

Digital Business Beyond Technology

...if the oil industry knew what the oil industry knows...

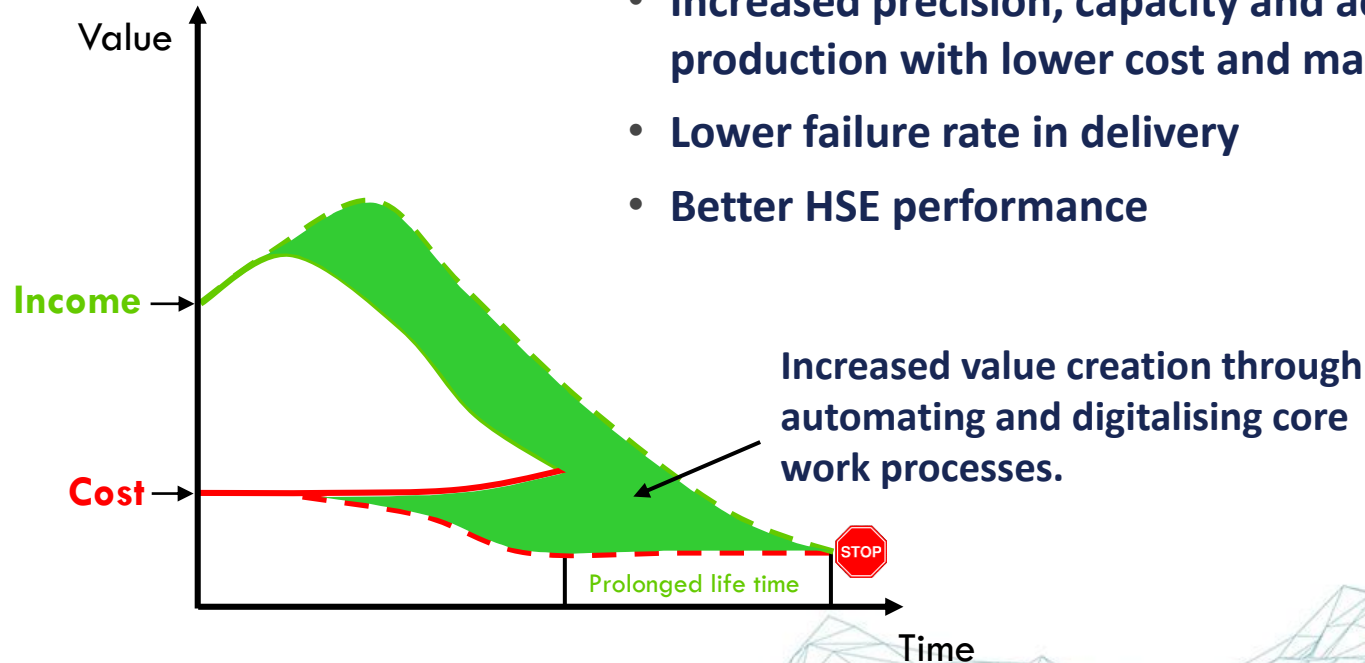
Anton Lettner, Head Digital Drilling Laboratory

Gerhard Thonhauser, Department Head

Why going digital as oil and gas company?

Increased value creation

- To be fit for emerging new business models
- Increased precision, capacity and accelerated production with lower cost and man hours
- Lower failure rate in delivery
- Better HSE performance



BUT Digital Business is not only IT

“Digital business is changing the way organizations use and think about technology, moving technology from a supporting player to a leading player in innovation, revenue and market growth.”

Gartner

Digital business is **about revenue, value, markets and customers**

Digital business is **outward-focused**

Digital technology and information **are enablers**

Digitalization Changes the Way of Working

Before		With digitalization
Data Silos, slow and complex	➡	Easy data access, any time
Dependent on physical location	➡	Independent of location
Single discipline	➡	Multidiscipline teams
Decisions based on experience	➡	Decisions based on facts
Reactive	➡	Proactive
Serial	➡	Parallel
Manual work process	➡	Automated work process

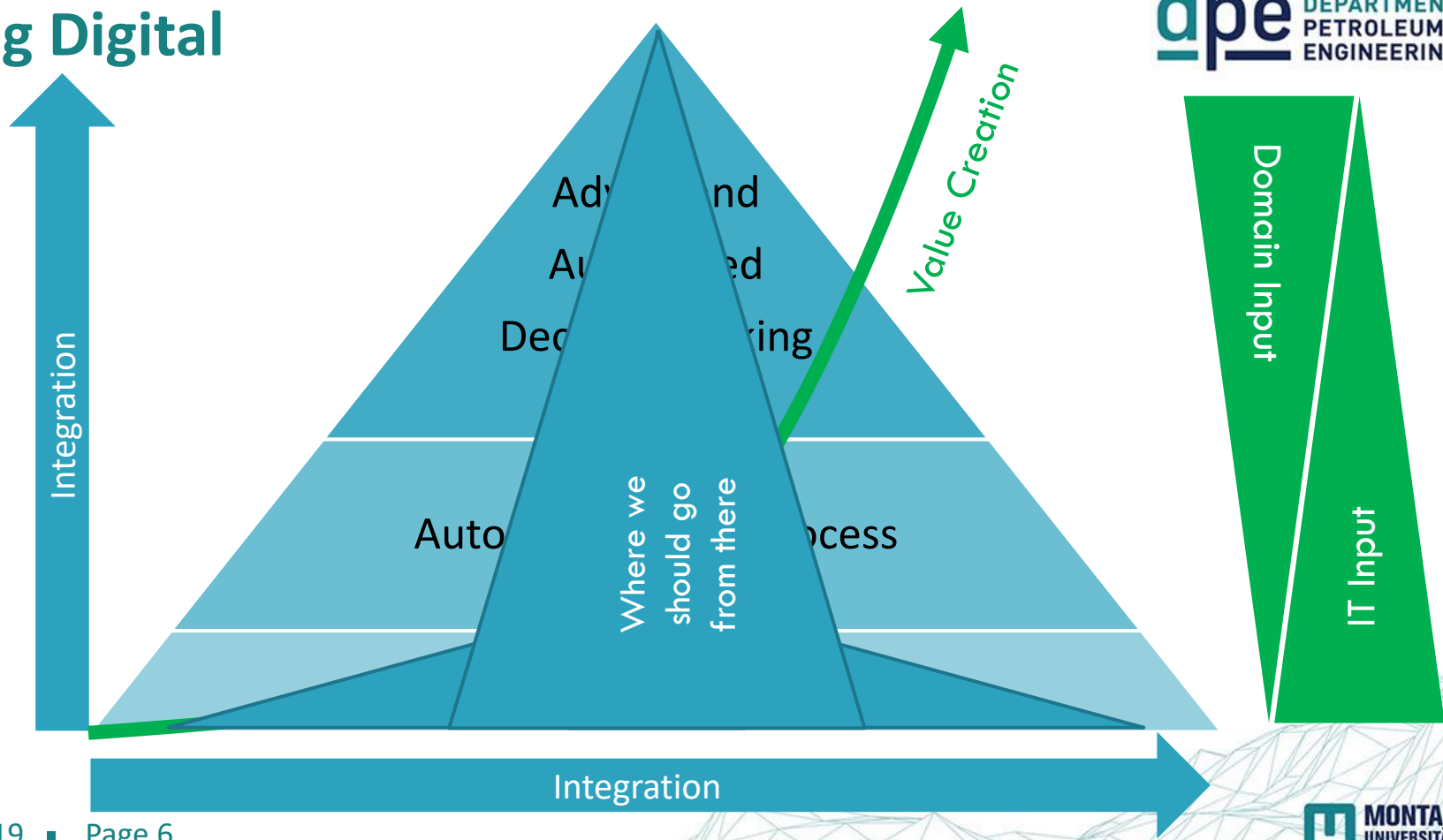
Creating the “Data Empowered Employee”

The Data Empowered Employee

- Will have more information than ever at the “finger tips”
- Will be able to make much bigger decisions supported by data
- Decision will be auditable
- Consequences will be measurable
- Will be managed in a different way



Going Digital



Amazon Go – transforming grocery stores

Amazon Go is a chain of grocery stores operated by the online retailer Amazon, currently with three locations in Seattle, Washington and two in Chicago, Illinois. The stores are partially-automated, with customers able to purchase products without being checked out by a cashier or using a self-checkout station.

Google Maps – transforming navigation

Google Maps is a mapping mobile app developed by Google for the Android and iOS mobile operating systems; it uses Google Maps for its information.

Netflix – transforming the media services

Netflix is a media services provider focused subscription-based streaming media service, which offers online streaming of a library of films and television programs.

Uber – transforming the taxi business

Uber is primarily a peer-to-peer ridesharing company. Its platforms can be accessed via its websites and mobile apps.

Source: after www.wikipedia.org

Solve a pain and create a new way of doing business

Create novel data collection, storage and processing capabilities

- “Data farming” versus “Data mining”

Automate workflows

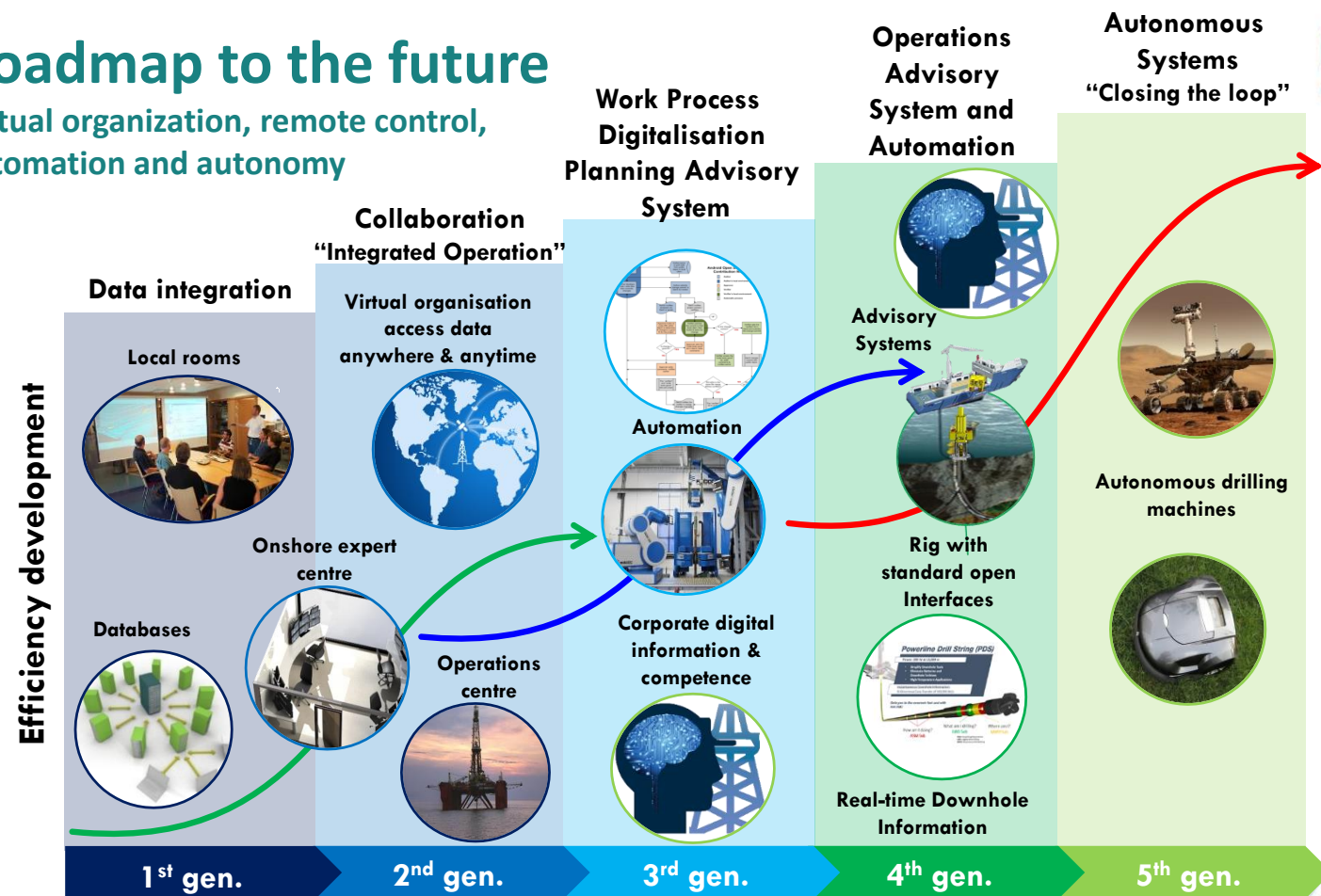
- Reduce human influence and eliminate mundane work

Change the way of delivery of information

- “Ready to use” information, anytime and anywhere

Roadmap to the future

Virtual organization, remote control, automation and autonomy



PLAN – Prepare for implementation

- Engineering
- Planning and Scheduling
 - **Communicate KPI Targets**
 - **Incorporate Learnings and Best Practises**
- Job Preparation Training, Simulation

ACT – Evaluate results

- Identify positive and negative deviations from plan
- **Derive new KPI targets from**
- **Audit Feedback** to capture **Lessons Learned** and **Best Practises**



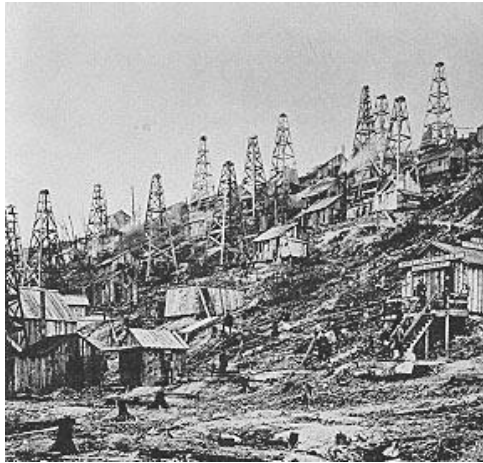
DO – Execute the plan

- Work process sequencing
- Operations compass and compliance
- Condition monitoring and advice
- Performance as part of daily workflows

CHECK – Measure

- **Automated Reporting Assistant**
- Capture deviations from plan
- Collect, quality control and process data
- **Measure KPIs** to identify **Invisible Lost Time**
- Capture **Feedback** from operations personnel on **Lost Time**

GEN 4: Integrated Drilling Surface System



Oil rigs beginning 1900



Standard rig, 1960 to 2000

- **Global Rig Fleet**
 - 4000 Land Rigs
 - 800 Offshore Rigs
- About **150,000 people** as **rig crews** required



Automated drilling rig
Bauer, 2013

GEN 4: Integrated Downhole Drilling System

Understand downhole to gain full control

300 W downhole

continuous electrical power supply from surface

10,000 times more data than the best mud pulsing technology: 500,000 bit/s

Mud Pulse	max. 50	bit/sec
Conventional Wired Pipe	56,000	bit/sec
PDS	500,000	bit/sec

500,000 bit/sec data rate for real-time understanding of downhole environment

Continuous 300 Watt electrical power supply from surface provides **100% control** of downhole operations

New generation of high performance downhole tools with simplified design at lower cost

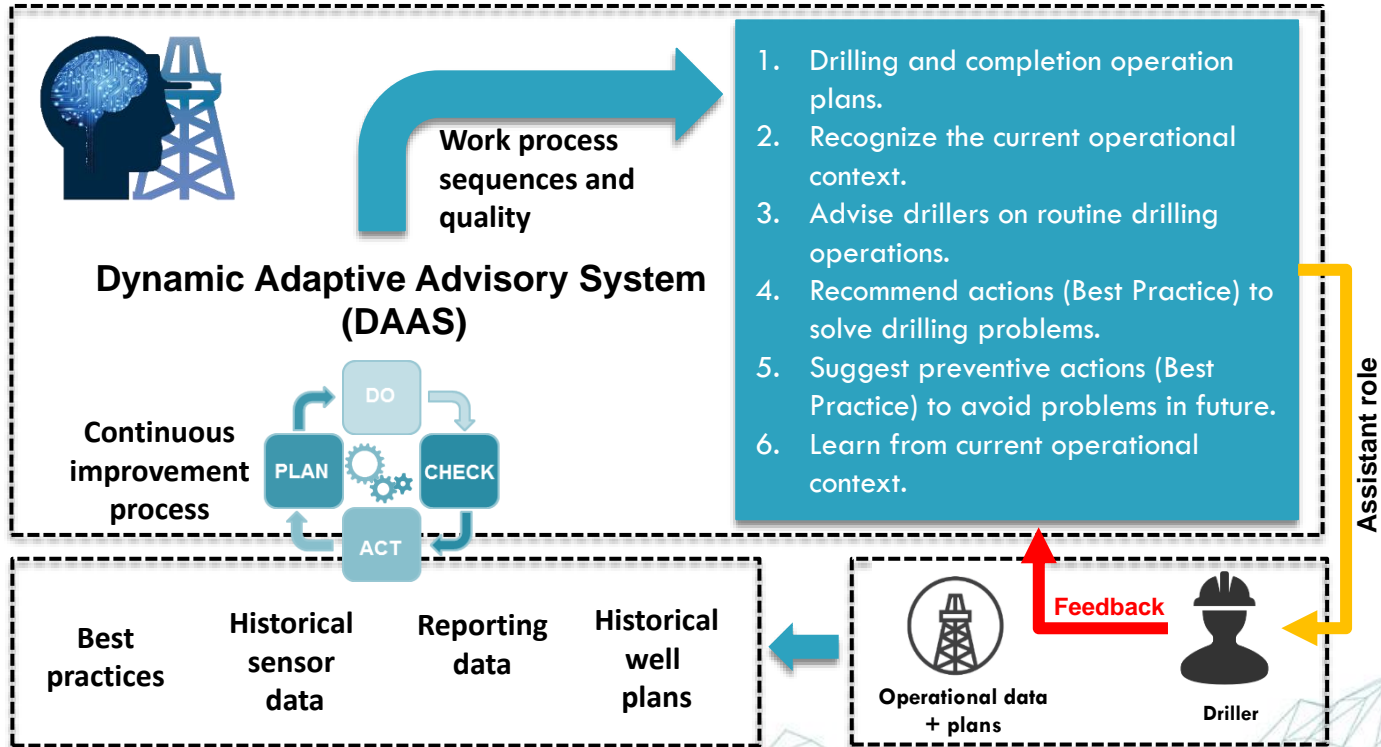
How am I doing?
Drill String Condition Monitoring

Motor and RSS

Where am I?
Real-time Directional Control
for Precise Well Placement

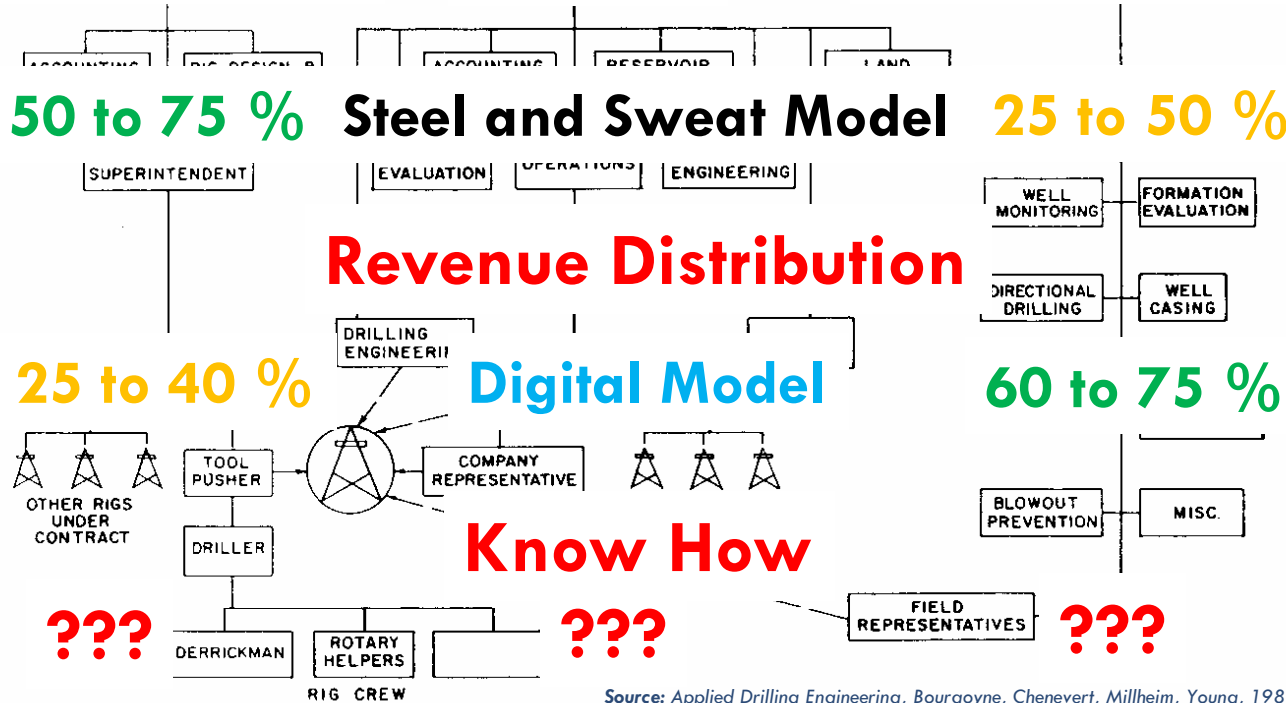
Where is the oil?
Looking Ahead and Around the Bit

From Monitoring to Advice and Control



Transition of Business Model Land Rig

Rig Contractor Operator Service Company



How does this picture and the revenue distribution change with digitalization?

Process control changed

Summary

- **Digital Business is about value, revenue - outward focused**
- **Embrace the “Data Empowered Employee”**
- **Data is an asset – do not only “mining”, but “farming”**
- **Develop use cases to transform your business**
- **Understand relevant technology to make or buy**
- **Implement agile and fast to lead**
- **Do not forget the business model adjustments**

www.dpe.ac.at

anton.lettner@unileoben.ac.at

gerhard.thonhauser@unileoben.ac.at