



BILFINGER

Digitalization @Bilfinger

Digitalization of Industrial Services

Norway

Nicolas Spiegl | 30/11/2017

Added Value for Our Clients

E&T and MMO complement each other



BILFINGER

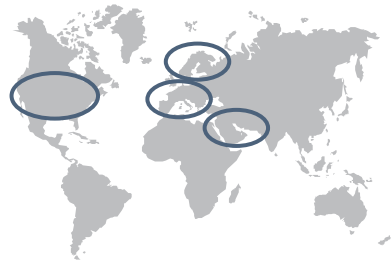
E&T – Engineering & Technologies



- Bundled expertise
- Faster roll-out of innovations
- Best practice transfer
- Approx. 9,000 employees

➤ Internationally positioned

MMO – Maintenance, Modifications & Operations



- Proximity to the customer
- Expertise on regional requirements
- High degree of flexibility
- Optimized capacity
- Approx. 23,000 employees

➤ Regionally positioned





Planning



Execution



Technology



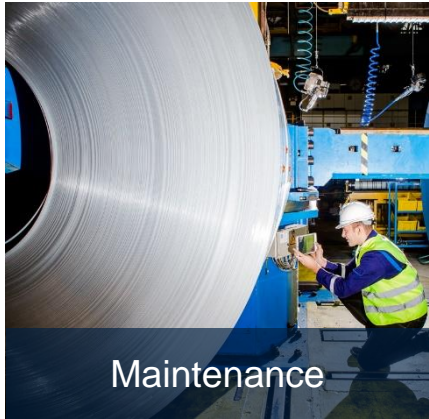
Construction

Differentiated proposition

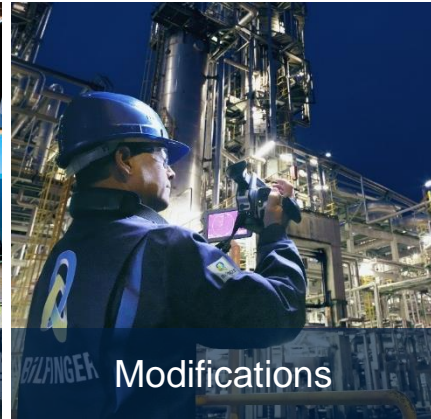
- International Network:
Strong position in Europe
- Engineering credentials
- Able to customize technical solution and project procedure
- Front runner digital engineering BIM - Building Information Modeling: intelligent 3D model-based process to efficiently plan, design, construct, and manage buildings, infrastructure and process plants.
- Active in many different industries and markets: cross transfer of solutions and knowledges

Bilfinger SE – MMO

World class maintenance



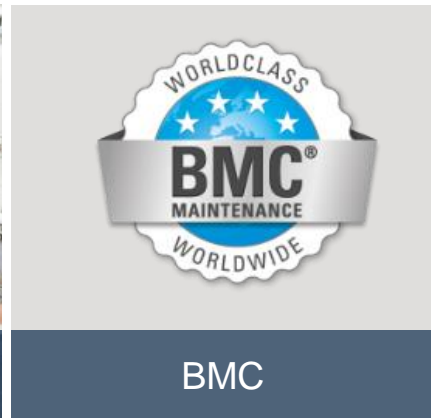
Maintenance



Modifications



Operations



BMC

Differentiated proposition

- Leading MMO provider in Europe
- Full service provider
- Proprietary and unique Bilfinger Maintenance Concept (BMC): Based on the experience of 23,000 maintenance professionals, 400 maintenance analysis and 100 partnerships
- International / regional footprint
- Health and safety excellence
- People excellence

Bilfinger SE – Digital Center

World class innovation



IIoT Pilot Plant

Research and Innovation

- Connectivity
- AI Solutions
- Predictive Maintenance



xReality Solutions

Design, Experience and Training

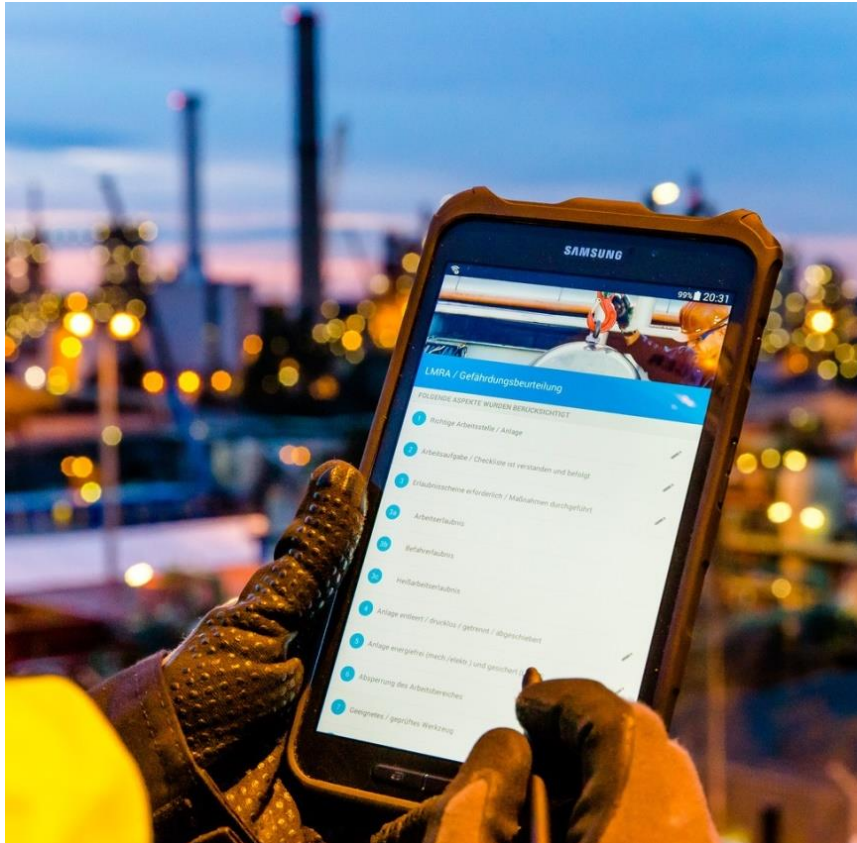
- Augmented Reality
- Mixed Reality
- Virtual Reality



UAV Services

New Technologies

- Own Pilots and Drones
- Technology Expertise



Differentiated proposition

- Integrated global IT
- In-house SAP consultants
- Application developer
- Process automatization services
- Digitalization & Innovation Lab with CDO

Trends “our observations” in our market

Challenges and opportunities



M&A / Cooperation



Digitalization



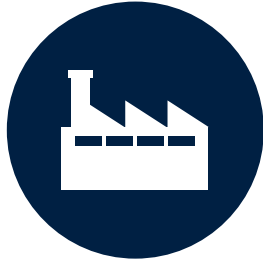
Ageing Assets



Ageing Workforce

Vision

Critical success factors



Plants



Data



Knowledge

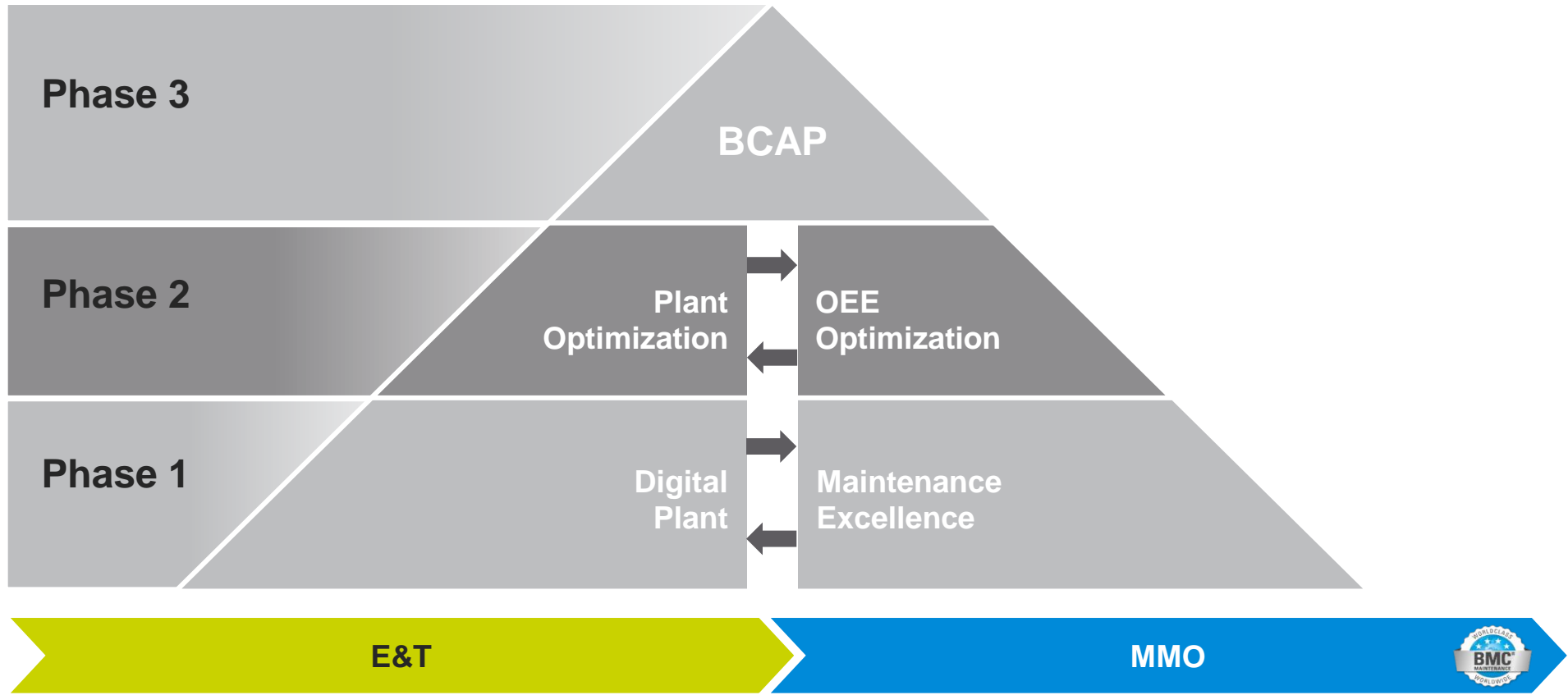
Life-cycle solutions

Data driven decisions

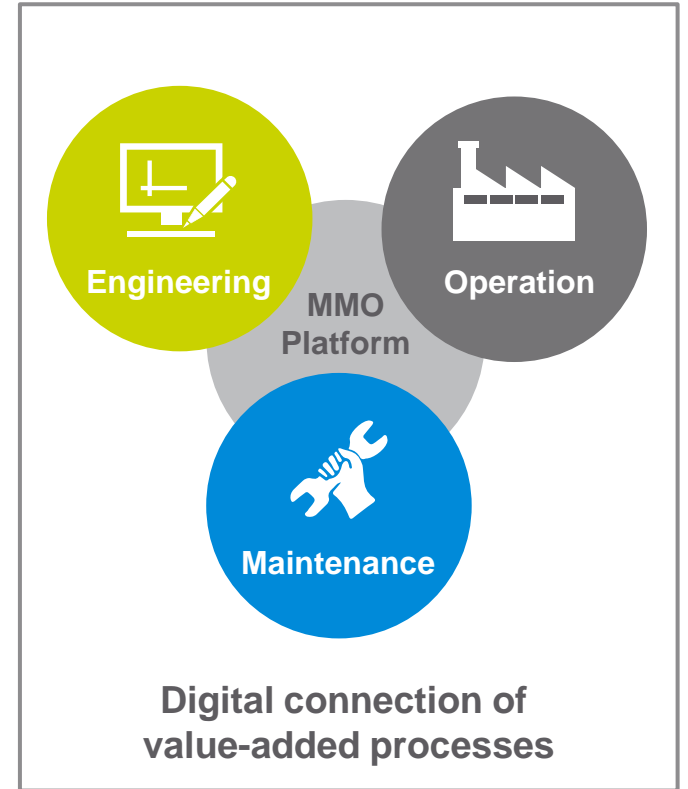
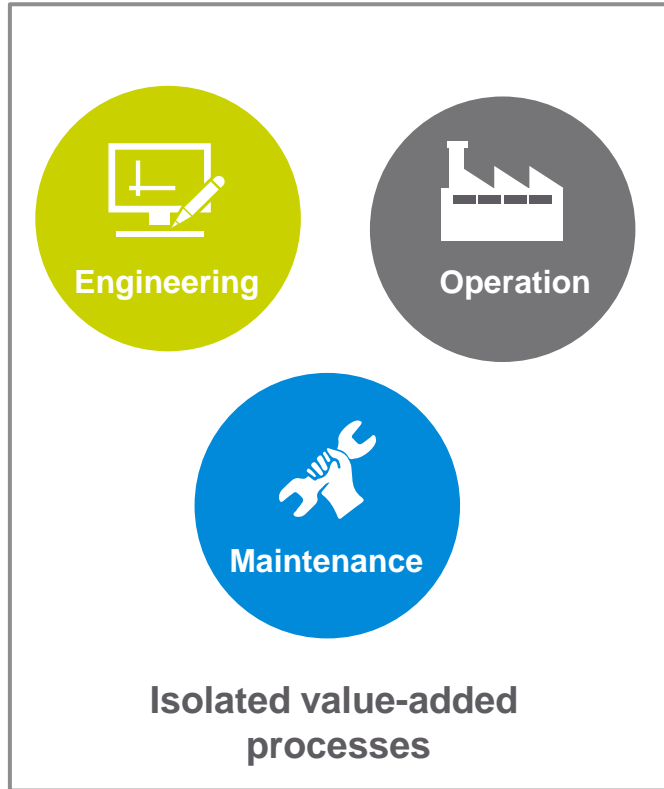
Digitalization of knowledge

BCAP – Bilfinger Connected Asset Performance
Our digital approach to gain process plant excellence

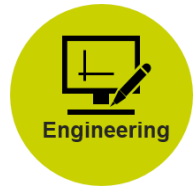
Bilfinger Connected Asset Performance (BCAP)



The Backbone of BCAP: MMO Platform



Bilfinger Connected Asset Performance (BCAP) Overview



Digital Twin

Human Sensors



Operation Data

Maintenance Data



Energy Data

Autonomous Sensors



e.g. Weather Data

Bilfinger
MMO-
Plattform

What has happened?

Descriptive
Analytics



What could happen?

Predictive
Analytics



What should we do?

Prescriptive
Analytics



Increasing OEE



- Productivity
- Availability & Reliability
- Quality & Sustainability
- Flexibility

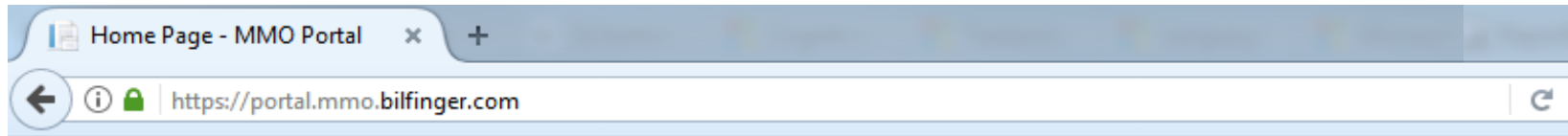
Reducing costs



- Maintenance costs
- Medium costs
- Energy costs
- Material costs

MMO-Portal

Connection between Bilfinger and client



DIGITAL TWIN



PLANT INTELLIGENCE



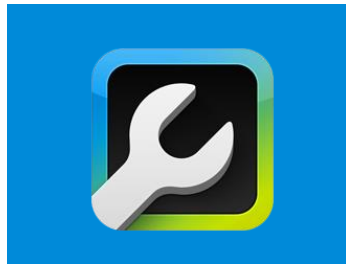
ASSET MONITORING



BMC® INTELLIGENCE



NOTIFICATION CENTER



KNOWLEDGE HUB



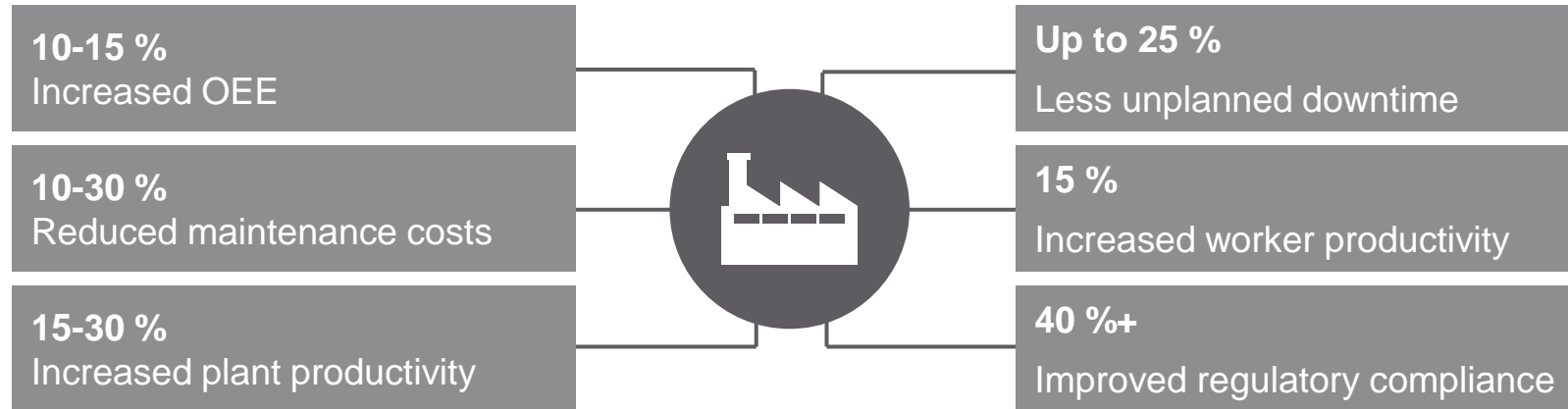
RELIABILITY ADVISOR



➔ Live demo

Potentials of BCAP for the plant operator

Value proposition



- ✓ Improved plant performance
- ✓ Reduced operating and maintenance costs
- ✓ Facilitated fulfillment of operator obligations

- ✓ Increased reliability and less unplanned downtime
- ✓ Increased plant productivity and lifetime extension of equipment

BCAP: New Business Services for Clients

Focus on new and innovative business model



01

Digital Maintenance (Plug and Play)

- BMC® dashboard
- Reliability adviser
- Predictive Maintenance



02

Digital Operation Service

- Operation of utility plants
- Centralize digital operation management
- Digital OEE optimization

03

Connected Process Packages

- As-built digital plant
- Remote optimization or operation support
- Data analytics & process improvement

04

New Business Solutions

- MMO platform optimizer as a service
- Pay-per-use models
- "Industrial Video Channel"

BCAP

Bilfinger Connected
Asset Performance

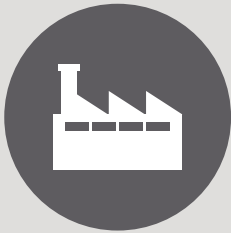
05

Analytics and Consultancy

- Operational Digital Consultancy
- B(O)MA
- Implementation Digital Maintenance

Bilfinger as Industrial Internet of Things (IIoT)-Translator

Plant operator



Digitalization hurdles

- Complexity
- Market insights
- High risks

Bilfinger



Building bridges

- Deep knowledge of customer needs and processes
- Comprehensive digitalization know-how
- Can realize digital potentials

Platform provider



Knowledge deficits

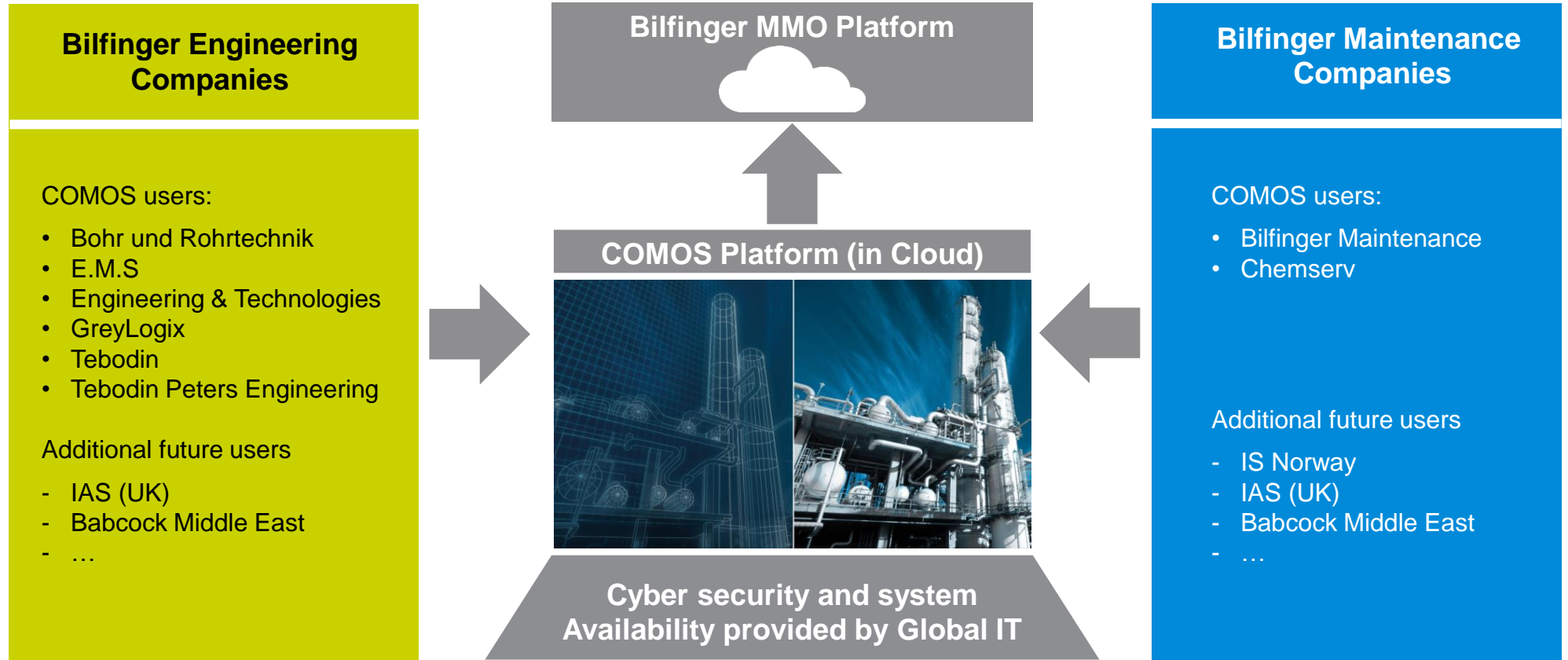
- Needs of plant operators
- Processes of maintenance tasks
- Access to customers

BILFINGER MAKES DIGITALIZATION WORK!

Digital Projects

Project 1: COMOS – Engineering and Asset Management Platform

Users of COMOS and Project Members



Project 3: Scrubber as a Service

Share Economy Transferred to the Vessel Industry

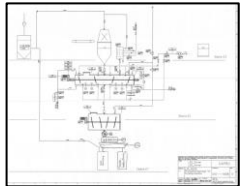
Sulfur Cap Guarantee to Lowest Fuel Price

Payment	No Upfront Investment Just Pay-Per-Use	Duration	Contracts for 3, 5 or 10 Years
Scrubber	Installation, Maintenance, Insurance and any Risk Covered	Charterer	Fee is Transparent Passed on to the Charterer
Fuel price	Operator Chooses the Best Price Available on the Market	Balance sheet	Our Strategic Partner Takes the Scrubber on its Balance Sheet



Project 4: AI-Powered Digital Twin

Bilfinger's Approach





PID e.g. as PDF




Legacy Plant Documentation




 **Bilfinger**



Automated Processing

 **Bilfinger**



Automated Classification & Extraction



XML Output According to ISO 15926



Tagged, Searchable Documents & Tables



P&ID
Process simulations
E&IC

Integrated engineering

3D Pipe stress analysis

Pump AP001

Datashets
sizing specs
PQM
documentation

Lists
isometrics,
pipe classes

Digital Plant Documentation, e.g. COMOS

Manual Steps i.e. PID Drawing are Replaced by Artificial Intelligence



50% Cheaper than Current Solutions



Highly Scalable



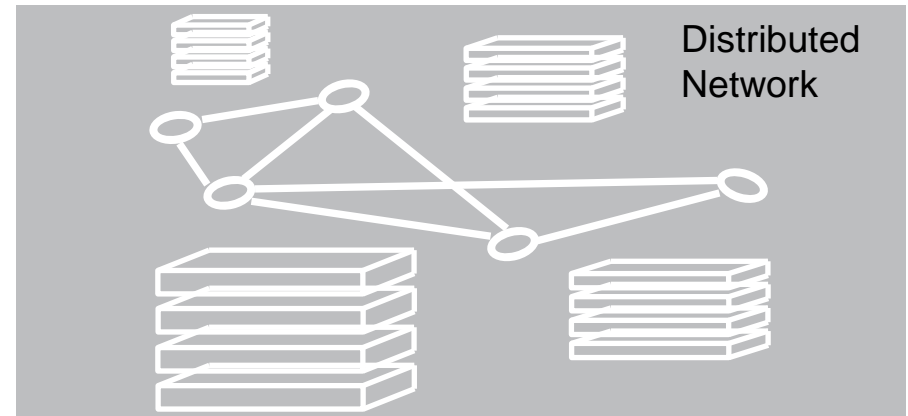
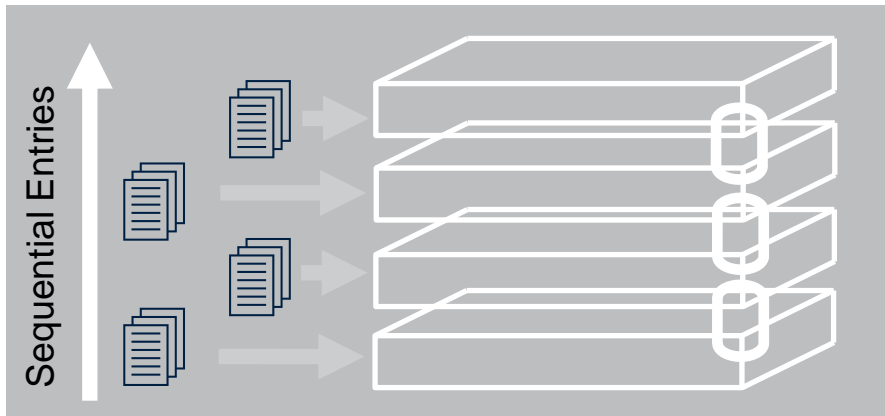
As a Service or as a Project

Project 8: Blockchain Technology

Blockchain for Industrial Service Applications

What is a Blockchain

1. Distributed database replicated across a network of participants
2. Database entries are combined into blocks
3. Blocks are linked to each other in a sequential order
4. Method for validating new database entries and propagation across network



**WE
MAKE
DIGITALIZATION
WORK.**

Any more questions?