Vessels for the Future – embracing digitalization

Digital Ship Singapore

Dr. Pierre C. Sames
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Massive change is ongoing

**Big Data**
- Increasing volume
- Increasing velocity
- Increasing variety
- Increasing veracity

**Internet of Things**
- Things become smart
- Smart products will radically change product boundaries and competition

**Connectivity**
- People are connected
- Things become connected

**Computing power**
- Moore’s law turned 50 this year.
- Experts expect continuation to 2020

**Automating knowledge services**
- Opportunity and challenge
Data will change ship development and production

Trends and impacts

Towards open product performance
- More sensors will be installed and their data streams will be available and become analysed

Towards model-based approaches
- Data models will be used to complement and eventually replace document-based system descriptions

Towards the digital twin
- Every physical item will have a digital twin which can be used for simulation

Towards cyber-physical systems
- Systems become smart and connected and will be targets for cyber attacks

Opportunities

Product development
- Integrate operational experience
- Speed up development cycle

Production
- Smarten logistics
- Simulate and automate assembly

After sales
- Offer condition-based maintenance
- Develop new business models addressing life-cycle and cyber risks
### Data will change ship operation

#### Impacts

**Towards open product performance**
- More sensors will be installed and their data streams will be available and become analysed
- Ships will be transparent

**Towards the digital twin**
- Near-real time simulation of ship performance

**Towards cyber-physical systems**
- Ships will be more automated and may become unmanned.
- Ships will be targets for cyber attacks

#### Opportunities

**Fuel saving**
- Ship and fleet performance management
- Routing

**Asset integrity and downtime**
- Condition-based maintenance
- Condition-based survey

**Safety and environmental performance**
- Asset safety status
- Emission inventories

**Asset utilisation**
- Route-, season- and voyage-specific flexibility
DNV GL already uses big data to provide customer value

- ECO Insight – Performance Mgt
- ShipManager Hull – Integrity Mgt
- Safety Dashboard
- Model based approval
• A new European research association to coordinate and promote **maritime technology** development & innovation

• Addressing societal challenges for **safer, cleaner and efficient transport** and the industrial challenge to **competitiveness**

• Convinced that **sustainable growth** can be achieved with maritime innovations

• Aim at **private-public partnership** to ensure long-term commitment
By 2050, we will be using our **maritime space and inland waterways** for transport, food and energy production, mineral exploitation, but also for urban dwelling, leisure, tourism and manufacturing.

The increased use of our **ocean space** requires that it is well organized, secure and supported by **safe and clean vessels**. Challenges relate to:

- vessels operating with **drastically reduced emissions** and meeting strict **safety requirements**
- industry **rapidly implementing** new technologies, building advanced vessels and operating more complex vessels
- industry **training** highly specialized manufacturing and operating personnel
- industry providing **innovative and digital services** in a more competitive waterborne environment

- Industry **adapting** to the ever faster changing business environment
Sustainable Growth through Maritime Innovation

- addressing societal and industrial challenges

**Safer maritime transport**
- Working on new built ships becoming as safe as equivalent onshore operations

**Cleaner and efficient maritime transport**
- Meeting required IMO and proposed EU emission reductions
- Supporting modal shift and blue growth
- Delivering more fuel-efficient vessels

**A competitive industry to create new jobs**
- Sustaining leadership in ship and ship system development and production
- Using the innovation potential of SMEs
- Embracing digital business opportunities
Vessels for the Future represents all stakeholders of the maritime value chain: ship owners, shipyards, system suppliers, classification societies, research institutes and academia.

Today, 61 members from 15 EU Member States have joined – with half of the members representing industry.
Embracing digitalization

- Change will never be as slow as today
- Data is nothing, algorithms matter
- Adopt rapid prototyping
- Cooperate and share
- Explore new business models
Thank you for your kind attention.

Dr. Pierre C. Sames, Director Division Technology and R&D
pierre.sames@dnvgl.com
+49 172 4192155

www.dnvgl.com

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