



# BIG DATA

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# DEFINITIONS AND CAUTIONARY NOTE

Reserves: Our use of the term “reserves” in this presentation means SEC proved oil and gas reserves.

Resources: Our use of the term “resources” in this presentation includes quantities of oil and gas not yet classified as SEC proved oil and gas reserves. Resources are consistent with the Society of Petroleum Engineers 2P and 2C definitions.

Organic: Our use of the term Organic includes SEC proved oil and gas reserves excluding changes resulting from acquisitions, divestments and year-average pricing impact.

Resources plays: Our use of the term ‘resources plays’ refers to tight, shale and coal bed methane oil and gas acreage.

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# BIG DATA: AGENDA

- What is it?
- What's happened elsewhere
- What's happening in Shipping
- What could happen in Shipping
- Risks and Opportunities

## What is it?

- Large, complex data sets requiring high performance analytics
- Bringing multiple types of data together to deliver insight and value
- Using data to provide new solutions, create new products and new markets
- Not just volume!

## Airbnb, Uber, Amazon marketplace, car clubs etc

- Own nothing
- Platform in the 'sharing economy'
- Enabled by communications tech
- **Utilisation of assets**
- Now using data to understand their markets and expand

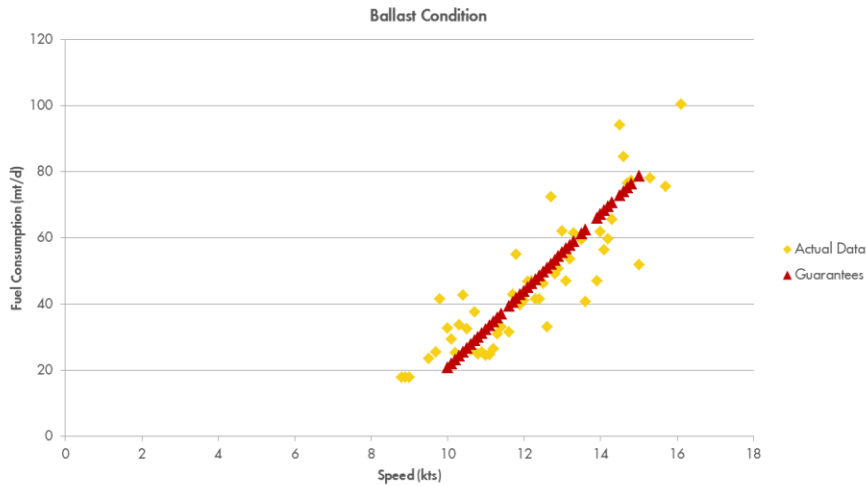
# TODAY IN SHIPPING



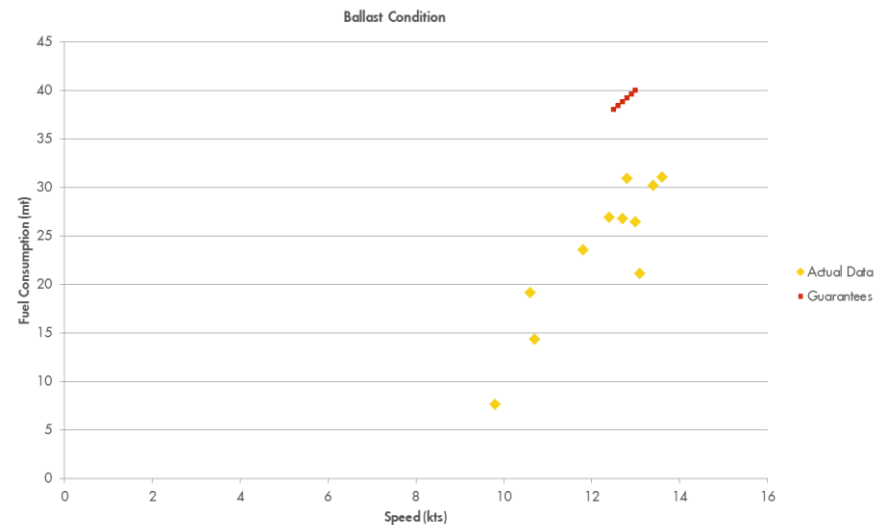
- Lots of players, lots of data and lots of analytical solutions
- Unconnected platforms enabling equipment monitoring, vessel fuel and routing performance management, often using noon reports
- But is any of it 'Big'?

# TODAY: FOCUS ON EFFICIENCY

- Focus on safe operations and commercial efficiency
- Noon report data plus
- Loggers on ships to compare Noon report data to more frequent data recording



- Why? Because if we better understand how a ship performs, we can reduce cost and optimise its deployment



# WHAT'S NEXT?

## ■ Short-term:

- Optimal routing and weather-based routing?
- Performance monitoring for optimal hull and propeller cleaning?
- Condition-based maintenance?
- Automatic data retrieval from vessels and E2E analysis?
- Improved safety – barrier management?

## ■ Long-term:

- Extended/ condition-based dry-docking?
  - Automatic data retrieval from vessels and E2E analysis?
  - Repeatability in operations leading to better planning?
  - Aligned incentives between owner and charterer?
  - Feedback loop to industry to improve shipping designs?
  - Integration with ports, terminals and service providers?
  - Automatic enforcement of emission control legislation?
- 
- Move from technical to commercial value.....

### Stakeholder benefits

**Owner/operator:**  
Lower OPEX, better scheduling, fewer days off-hire, more attractive to customers

**Yards /OEMs:**  
Better products whose design is based on performance data  
Improved ability to predict performance  
Predictive maintenance

**Charterer:**  
Lower fuel bill, improved scheduling

**Service providers:**  
New business opportunities: new products, extended services

**Business models:**  
Autonomous ship  
Costs linked to performance

# future nautics - Shipping 3.0

- SMAC Technologies
  - Social
  - Mobile
  - Analytics
  - Cloud



- Firefighting Robots
- Human multitasking causes IQ to decline
- Hull Cleaning Robot



- Augmented Reality Monitors and Glasses
- Wearable Tech
- Onboard robotics
- Daqri Smart Helmet

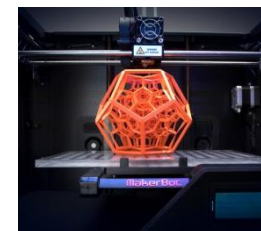


- EU funded 3.5 million euro into Maritime Unmanned Navigation
- Autonomy in other sectors, e.g. mines
- Use in dangerous situations? E.g. fire fighting
- Regulation and international law as obstacle - not technology
- Cheaper operation of ships
- More Vsat bandwidth available with no crew onboard



- Prediction
- Use of smart algorithms using ship data to predict ship's performance
- Safety – barrier mgt,
- Port logistics operated with the efficiency of an airport –
- Cloud, Internet of Thing
- 3D Printing of spares at ports
- 3D Printing reducing need for container vessels carrying goods
- Drones delivering spares – no diversion or delay

- Gaming to improve job role related skills
- Improve retention
- Improve performance with internal competition





# RISKS

- Security
  - of data collection, transmission and storage
  - of suppliers' and customers' systems
  - resilience
- Ownership of and access to data
- Silos
- Legislation keeping pace with data and technological change

# QUESTIONS



