

### SMC Foresighting Workshop No 3

# Digital/Autonomous Ship Development

## Workshop Report

This workshop was held on 30<sup>th</sup> April 2019 at Robert Gordon University, Aberdeen. Its objectives were to:

1. Build awareness of the opportunities & threats for Scottish businesses resulting from the adoption of digital / autonomous vessels shipping
2. Increase the visibility of potential solution providers in Scotland and the need for new solutions
3. Identify at least three options for collaborative actions and/or SMC-led activities

The workshop was chaired by Iain Weir of Optimat, who organised the workshop. A list of those who participated is attached.

The agenda is summarised below with the key discussion points detailed in italics. Each speaker's presentation is available.

### **Welcome and introductions**

- Douglas Lang, Anglo Eastern - chairman's introduction
- Professor John McCall, Robert Gordon University
- Iain Weir, Optimat

*The SMC Chairman (Douglas Lang) welcomed delegates to this 3rd Foresighting workshop and expressed his pleasure at holding an SMC event in Aberdeen. Professor McCall welcomed for the university and explained that he has been actively involved in a range of projects to assess and optimise sea and land operations.*

*Iain Weir of Optimat summarised the context for the workshop and provided extracts from the 'Analysis of the Maritime Sector in Scotland' and some examples of what other clusters are doing in this area. He then introduced the objectives and agenda for the workshop.*

### **Relevant Experience of the Innovation Community**

There were four presentations that highlighted the capabilities of the innovation community to assist the maritime sector to enhance its operations by adopting digital technologies. These are summarised below, together with some of the key discussion points.

- Professor John McCall, Robert Gordon University

This presentation focused on projects to

- Optimise the supply chain to the offshore sector through dynamic optimised truck scheduling in real time (ARR Craib). This delivered a 17% productivity gain, valued at £1.5 million per annum.

- Offshore supply vessel planning. The potential to reduce the number of vessels used by 40 to 50% was identified through effective planning and pooling of need and the potential for a saving to North Sea operations of over £100 million was estimated.

The full report of this study is available at [www.theogtc.com/solutions/completed-projects/marine-logistics-feasibility-study/](http://www.theogtc.com/solutions/completed-projects/marine-logistics-feasibility-study/)

*Discussion Points:*

- *It is recognised that there are options to improve logistics, but any changes must not impact production. There is, currently, accepted over-resourcing to minimise risk.*
- *It is also recognised that information flow in the supply chain is very poor.*
- *The potential changes that could arise from such optimisation could be quite disruptive to the offshore supply sector, so would need to be managed carefully.*
- *It was suggested that a potential project to identify optimised transport using road / rail / sea to supply large remote opportunities (e.g. Heathrow Runway 3 development) may be of interest.*
- Ian Philips, The Oil and Gas Innovation Centre (OGIC)  
This presentation took a user perspective and identified the potential opportunities to implement higher levels of digitisation in the sector. The key area of opportunity was identified as optimising operations (and reducing crews) using digital technologies.
- Rachel Wakefield, CENSIS  
The role of CENSIS to support innovation in sensors, sensor systems and the Internet of Things (IoT) was presented. Some examples of how these technologies could be applied to enhance performance in the maritime sector were described.
- Karen O’Hanlon, The DataLab  
The role of The DataLab to support innovation in, and the application of, data was presented. Some examples of how data could be used to enhance performance in the maritime sector were also described.

*It was recognised that a key issue was the development of digital skills within the workforce – ranging from the basic use of IT (e.g. emails / excel files) to sophisticated data science.*

**A Case Study – Partnership with the Innovation Community**

*Kevin Moran of Tymor Marine presented a short case study on the development of stability measurement of ships and offshore while in service. The development of accurate measurement technologies and of data handling and analysis were identified as critical to success. The roles of CENSIS and The DataLab in supporting Tymor Marine were highlighted as very important in achieving success in this development.*

**Discussion – Key Challenges and Barriers / Potential Project Opportunities**

There was a wide-ranging discussion on key issues / challenges for the offshore supply sector and how SMC led projects could be very valuable in addressing these. The multi-stakeholder structure of the workshop was considered very helpful to understand skills and capabilities and develop project ideas.

The embryonic project ideas identified during discussion can be summarised as follows:

1. Supporting the positioning of vessels at fixed installations

A need to improve the procedures within 500 metres of a fixed installation was identified as a key issue, driven by optimising the safety of operations. This relates specifically to the decision made in difficult weather. The lack of individuals with maritime skills on fixed installations is a risk factor here. Three areas for development identified were:

- Collation of data to characterise the current situation
- Benchmarking behaviour to develop recommended behaviour and to encourage the industry to develop best practice
- The potential to use sensing and monitoring technologies to transfer decision making in these situations to experts on shore.

It was suggested that this topic should be raised with the Marine Safety Forum.

Project champion: Matthew Hayden, Tymor Marine

2. Data Sharing / Open Innovation

Stena Drilling highlighted that it was collecting lots of data that it is not using. It will make this available to others who can use the data to identify improvements or develop new technologies. There is a potential open innovation model that could be developed.

There were, however, some concerns expressed about data ownership and this would need to be clarified.

Project champion: Colin Dawson, Stena Drilling

3. Condition Monitoring

The opportunity for operators to share condition monitoring data in a mutually agreeable way to identify areas for improvement was identified. The work done by John McCall of RGU on offshore scheduling was seen as a potential model to follow. It was recognised that there would be issues with data sharing, but it was considered that there were mechanisms to overcome these (trends rather than actuals / development of secure data havens (as for medical data)).

4. Addressing changing operations in the North Sea

It was highlighted that, in the future, operations in the North Sea will change. There will be fewer large platforms, more smaller floating rigs and more subsea operations. There will also be, in time significant, decommissioning activity. All will require monitoring to ensure effective operation / safety. A current example of the potential to use technology in such situations is a TDL/OGIC project applying artificial intelligence technologies to monitor for defects.

This topic could be explored in more detail to identify opportunities for applying digital technologies to support future operations. Completion of a detailed scoping study would be a relevant next step.

### Sources of Funding and Advice

- Jamie Macleod, Scottish Enterprise (Advanced Manufacturing)

*The numerous sources of support for innovation and business growth, both from Scottish Enterprise and other public sector organisations, were highlighted. The importance of engaging with the support*

*network to discuss opportunities and challenges so that the best package of support is offered was highlighted.*

### **Conclusions**

It was agreed that this was a very positive event and an important first step in engaging with the maritime sector based in the North east of Scotland. There was a strong interest in further activities in the future.

## Annex A – List of Attendees

Name	Company Name
Neil Amner	Anderson Strathern
Douglas Lang*	Anglo Eastern
Patrick Carnie	Babcock
David Burke	Babcock
Mark Stagg	City of Glasgow College
Robert McCaig	Dales Marine Services Ltd
Jamie Grant	Grant Marine
Lindsay Butler	Lloyds Register
Captain David Thomson	Orcades
Alexandra Thomson	Orcades
Charlotte Strang-Moran	ORE Catapult
Bruce Craig	Pinsent Masons
Craig Moir	Scottish Enterprise
Julie Brown	Scottish Enterprise
John Strathearn	Serco Northlink Ferries
Colin Dawson	Stena Drilling Ltd
Caroline Hutton	Transport Scotland
Matthew Heyman	Tymor Marine
Kevin Moran*	Tymor Marine
Prof John McCall*	Robert Gordon Univeristy
Ian Philips*	OGIC
Rachel Wakefield*	CENSIS
Karen O'Hanlon	The DataLab
Jamie Macleod*	Scottish Enterprise
Iain Weir*	Optimat

Workshop speakers are denoted with \*