UK Marine Industries Roadmap & Capability Study

Workshop A: Marine-related services & ICT, 20 Sept 2011

Report Issue 1.0

Dominic Oughton do251@cam.ac.uk IfM

Executive Summary

This report results from a one-day workshop to assist the Technology Strategy Board, BIS, UK Marine Industries Alliance and the Transport KTN to develop a roadmap to identify future priority opportunities and capability needs for the UK Marine Industries. The workshop was the first of five "Deep Dive" explorations of the sector, focussing on Marine Services and ICT. The workshop took place at the Southampton University Technology on 20 September 2011, with input from over 20 experts drawn from across the Marine Industry, academia and other stakeholders. The workshop took a sub-set of the landscape roadmap, developed in June 2011, which was then developed further to identify priority trends & drivers and then to identify and characterise around 30 Market Opportunities in Marine Services & ICT.

Participants contributed before the workshop by providing their perspectives in a roadmap template – identifying priority Drivers, Opportunities, Capabilities and Enablers in the Short, Medium and Long timeframes. These were consolidated ahead of the workshop to provide a start point to which further issues were added and priorities identified. The most important market opportunities were then highlighted, where UK capability could deliver against major global market needs. These assessments were based on defined criteria for Value (global & UK market, competitive strength, added value and impact on societal and environmental challenges) and Capability (in the marine industry, academia, research organisations and from adjacent industries – see Appendix C for details.)

In prioritising relevant Trends & Drivers (see section 1), there was a strong emphasis on security and safety, the changing nature of military threat and consequent needs for marine surveillance; Climate change figured strongly in relation to adaption (eg to rising sea levels), mitigation (through renewables and greater efficiencies) and as a driver for the "Green Economy"; availability of new technologies for CAE, simulation and modelling, ICT, positioning and integrated transport were all identified as important components of a solution to these challenges, whilst changing demographics, consumer demands and the challenging cost environment were also important.

Executive Summary (continued)

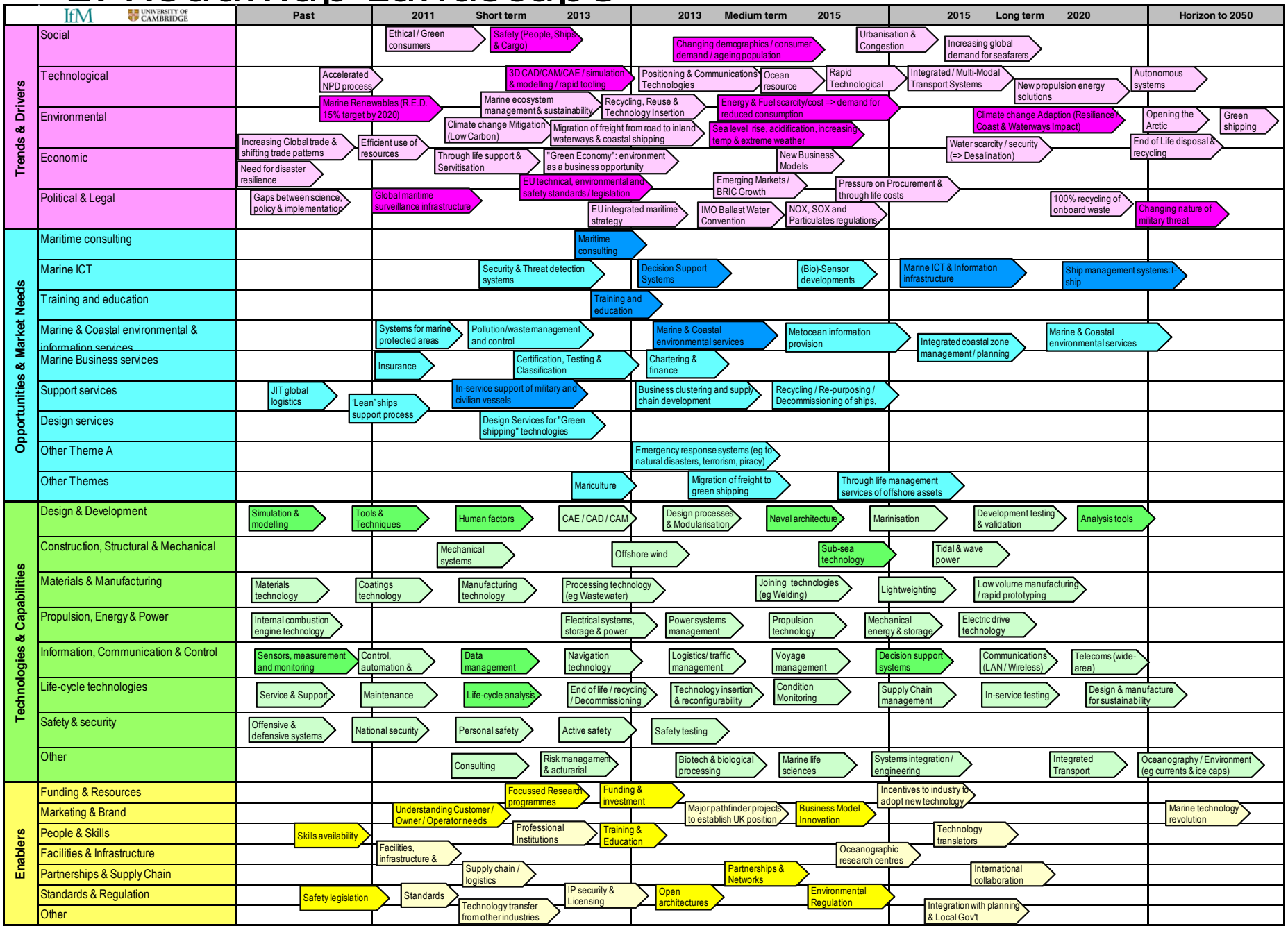
Priority Opportunities (see section 4) were identified across a range of services and ICT areas, with a significant overlap emerging for knowledge-based services. The leading opportunities included: Maritime consulting; Ship management systems: I-ship; Training and education (including virtual training); In-service support of military and civilian vessels; Marine ICT & Information infrastructure; Decision Support Systems; Marine & Coastal environmental services; Design Services for "Green shipping" technologies; Emergency response systems (eg to natural disasters, terrorism, piracy); Recycling / Re-purposing / Decommissioning of ships, platforms, oil rigs etc.; Insurance; and Certification, Testing & Classification.

Of these, the first seven were explored in more detail – to characterise the market value and identify relevant sources of UK capability for delivery (and potential gaps that will need to be filled – see section 7)

In support of these opportunities, a wide range of capabilities were identified from within the Marine Industries but also in academia and research organisations. The most relevant areas of capability to support these market opportunities were in Design & Development; Information, Communication & Control; and Life-cycle technologies. Specifically important capabilities included: Simulation & modelling; Life-cycle analysis; Sub-sea technology; Naval architecture; Data management; Sensors, measurement and monitoring technology; Human factors; and Decision support systems.

The workshop also identified other key enablers for success, underpinning these capabilities as: Skills availability; Funding & investment; Understanding Customer / Owner / Operator needs; Open architectures; Safety legislation; Business Model Innovation; Environmental Regulation; and Training & Education

1. Roadmap Landscape



2. Landscape Linkages

Trends & Drivers													Market Opportunities			Capabilities																						Enablers												
Safety (People, Ships & Cargo)	Autonomous systems	EU technical, environmental and safety standards / legislation	Positioning & Communications Technologies	Global maritime surveillance infrastructure	New Business Models	Changing demographics / consumer demand / ageing population	Climate change Adaption (Resiliance / Coast & Waterways Impact)	Marine Renewables (R.E.D. 15% target by 2020)	Energy & Fuel scarcity/cost => demand for reduced consumption	Rapid Technological Development (ICT, bio, nano)	Recycling, Reuse & Technology Insertion					Simulation & modelling	Life-cycle analysis	Sub-sea technology	Naval architecture	Data management	Sensors, measurement and monitoring technology	Human factors	Decision support systems	Tools & Techniques	Analysis tools	Condition Monitoring	Systems integration / engineering	Design processes & Modularisation	Control, automation & autonomy	Maintenance	Risk managament & acturarial	CAE / CAD / CAM	Service & Support	Consulting	Communications (LAN / Wireless)	Skills availability	Funding & investment	Understanding Customer / Owner / Operator needs	Open architectures	Safety legislation	Business Model Innovation	Environmental Regulation	Training & Education	Partnerships & Networks	Focussed Research programmes	Standards	Oceanographic research centres	
1	2	3	4	5	6	7	8	9	10	11	12			Market Opportunities		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9	10	11	12	
1	1			1	1						1	A	Maritime Consulting (Submarine)	5		3	3	3	3		3																1			1											17
1	1	1	1						1	1		B	Ship Management Systems - I-Ships	6		2				3		1	3	2	2	3	3	2	3						1	1	1	1	1	1	1	1										32
1	1					1						C	Training & Education incl. Virtual training	3		3	3	3	3	1	3	3										3	3				1	1	1		1	1		1	1	1	1	1				35
			1		1			1			1	D	In-service Support of Military & Civilian Assets	4		3	3	3	1	3	3	1	3	3	1	3		2	2	3	1	1	3		1	1		1	1		1	1				1						46
1	1		1	1	1	1				1		E	Marine ICT & Information Infrastructure	7		3	2			2		3	2	3	3	2	3	2	3	3			3	2	3	3	1	1	1	1	1		1	1	1	1	1						52
1		1		1			1	1	1			F	Decision Support Services	6		3	3			3		2	3	3	3	3	3	3	3	1	3	3		3	3	2			1	1	1	1									1		50
		1					1					G	Marine & Coastal Environmental Services	2		3		2		3	2	2	3	3	3	1	2	2	2	2		1	2	3	2	1	1					1	1	1	1		1					45
5	4	3	3	3	3	2	2	2	2	2	2					20	14	11	7	15	11	12	14	14	12	12	11	11	11	11	7	8	10	9	9	6	5	5	5	4	4	4	3	3	3	3	3	

Technology Strategy Board
Driving Innovation

UK Marine Industries Alliance

Knowledge Transfer Networks

BIS Department for Business Innovation & Skills

Dominic Oughton do251@cam.ac.uk IfM

3. Priority Market Opportunities (summary)

Opportunities	Market Attractiveness:					Triple bottom-line		Value	Fit with UK Capability						Fit	Total
Opportunity	Global Market Size	Home (UK) market size	Strength of competition	Added Value / Margin	Cross-sector opportunity	Planet / Environmental	People / Societal	Weighted Value	Marine Industry	University / Academic	RTO / Design Services	Other Industry	Other UK resources	Timeliness	Weighted Capability	Combined Value & Fit
Maritime consulting	4	2	1	4	1	1	3		3	2	2	1	1	1		
Ship Management Systems - I-Ships	4	2	2	1	1	2	2		3	2	1	3	1	2		
Training & Education incl. Virtual training	3	1	2	4	0	3	3		2	4	3	3	3	1		
In-service Support of Military & Civilian Assets	4	4	2	2	3	3	1		3	3	2	3	2	2		
Marine ICT & Information Infrastructure	4	2	1	2	1	1	3		3	4	3	4	2	3		
Decision Support Services	4	2	3	4	4	2	2		1	3	3	4	4	3		
Marine & Coastal Environmental Services Monitoring	3	2	1	2	2	3	2		2	3	3	3	1	3		

See over for outputs from breakout group exploration of Priority Market Opportunities.

Key: **Black text – original team input**
Red text – carousel group comments

4 Capability - Ranked

Capabilities		A	B	C	D	E	F	G	
		Marine Consulting (Submarine)	Ship Management Systems - I-ships	Training & Education ind. Virtual training	In-service Support of Military & Civilian Assets	Marine ICT & Information Infrastructure	Decision Support Services	Marine & Coastal Environmental Services	TOTAL Theme A Marine Services & ICT
Ranked capabilities (top-level grouping)									
A Total	Design & Development								
I Total	Information, Communication & Control								
L Total	Life-cycle technologies								
O Total	Other								
C Total	Construction, Structural & Mechanical								
P Total	Propulsion, Energy & Power								
M Total	Materials & Manufacturing								
S Total	Safety & security								
Ranked capabilities (detail)									
A1	Simulation & modelling	3	2	3	3	3	3	3	
L3	Life-cycle analysis	3	0	3	3	2	3	0	
C4	Sub-sea technology	3	0	3	3	0	0	2	
A6	Naval architecture	3	0	3	1	0	0	0	
I3	Data management	0	3	1	3	2	3	3	
I1	Sensors, measurement and monitoring technology	3	0	3	3	0	0	2	
A3	Human factors	0	1	3	1	3	2	2	
I7	Decision support systems	0	3	0	3	2	3	3	
A2	Tools & Techniques	0	2	0	3	3	3	3	
A9	Analysis tools	0	2	0	1	3	3	3	
L6	Condition Monitoring	0	3	0	3	2	3	1	
O7	Systems integration / engineering	0	3	0	0	3	3	2	
A5	Design processes & Modularisation	0	2	0	2	2	3	2	
I2	Control, automation & autonomy	0	3	0	2	3	1	2	
L2	Maintenance	0	0	0	3	3	3	2	
O4	Risk managament & acturarial	0	0	3	1	0	3	0	
A4	CAE / CAD / CAM	0	0	3	1	3	0	1	
L1	Service & Support	0	0	0	3	2	3	2	
O3	Consulting	0	0	0	0	3	3	3	
I8	Communications (LAN / Wireless)	0	1	0	1	3	2	2	