Maritime Autonomous Systems Survey 2016
ON BEHALF OF THE MAS COUNCIL

Maritime Autonomous Systems (MAS) cuts across many of the interests of members of the Society of Maritime Industries (SMI). MAS impinges on operations in marine science research, the offshore energy market, deep sea mining, delivering a seismic shift in maritime warfare and security operations, and in maritime transport, where autonomy has the potential to improve the integration and effectiveness of both cargo and passenger transport. Across all of these areas, the UK looks to take a leading position, driven by development of the required technology, evolving the regulatory environment and ensuring we sustain the cutting-edge skills and knowledge already present in our industrial and academic bases.

As a result SMI took the decision to create a new interest group to focus on the business of MAS in 2016 and form a MAS Council of member experts to guide future policy. One of the Council’s first actions was to commission a base line survey of UK companies in the MAS sector to provide an insight into current business activity.

The data for this report were collected in the form of an on-line questionnaire sent to senior managers of UK businesses in the maritime engineering sector.

MAS Survey Executive Summary:

- 39 UK companies responded to this survey of which 46% were manufacturers of platforms, systems or sub-systems
- A majority, 54%, had been in this business for more than 5 years, however, this technology is attracting new entrants and 17% had been in the business for less than a year
- The figures point to an industry with an overall turnover of £200 million employing 500 people.
- The respondents expect these figures to double by the end of the decade.
- 21% of respondents recorded that MAS accounted for more than half their turnover.
- A fifth of companies derive more than half of their sales through exports.
- Europe is the biggest market for exports followed by Asia Pacific region, North America and the Middle East.
- MAS companies are working in a wide range of applications with defence, marine science research and the oil/gas sectors being the top three.
- Two thirds of respondents employ less than 10 people on MAS activity which is to be expected for a relatively new market sector.
- The depressed price of oil and a lack of access to finance were blamed for holding back growth closely followed by skills shortages.
Company Overview:

39 companies had responded to the survey questionnaire and, surprisingly for such a new area of business, 54% had been involved with maritime autonomous systems (MAS) for more than 5 years. Encouragingly, 17% of respondents have operated for less than a year showing this to be an up and coming business venture.

Main Business Areas:

46% of responses came from manufacturers (platform, equipment and sub-systems), 15% from service providers and 13% from systems integrators. However, there were also contributions from academic institutions, agent/distributors (e.g. equipment supplier) and naval architecture/design companies.
What is the size of your company's annual turnover related to MAS only (£)?

Figure 3: Size of Company’s Annual Turnover

Turnover:

Companies were asked to state their annual turnover in MAS activity and no respondent reported more than £50 million. [Figure 3] Respondents were then invited to state this figure as a proportion of their company’s overall turnover and 21% derived more than half their sales from MAS, but on the whole it was still a small part of most companies’ business. [Figure 4] A crude estimation of the sector’s UK turnover taking into account major players which had not participated in the survey suggested an overall turnover of £200 million.

What proportion of your overall company turnover is your MAS turnover? (%)

Figure 4: Proportion of overall Turnover that is MAS Turnover
Export Sales:

One company reported that all their sales were derived from overseas and seven reported figures between 60 and 90%. However, 47% said that they had no or negligible overseas earnings which was probably more a reflection of the relative immaturity of the global market at this time.

![Pie chart showing export sales from the UK](chart.png)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1%</td>
<td>16%</td>
</tr>
<tr>
<td>2-10%</td>
<td>1%</td>
</tr>
<tr>
<td>11-50%</td>
<td>7%</td>
</tr>
<tr>
<td>51-100%</td>
<td>11%</td>
</tr>
<tr>
<td>60-90%</td>
<td>8%</td>
</tr>
<tr>
<td>100%</td>
<td>47%</td>
</tr>
<tr>
<td>N/A</td>
<td>13%</td>
</tr>
</tbody>
</table>

**0-1% BREAKDOWN:**
- 16 companies stated 0%
- 1 company stated less than 0.5%
- 1 company stated <1%

**Figure 5: Export Sales**

Employment

Two thirds of respondents employ less than 10 people on MAS activity which is to be expected for a relatively new market sector. The answers suggested that only 500 were currently being employed overall on a wide range of tasks.

![Bar chart showing employment](chart.png)

**Figure 6: How many employees work in MAS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>1</td>
</tr>
<tr>
<td>4-5</td>
<td>1</td>
</tr>
<tr>
<td>6-10</td>
<td>1</td>
</tr>
<tr>
<td>11-20</td>
<td>1</td>
</tr>
<tr>
<td>21-40</td>
<td>1</td>
</tr>
<tr>
<td>41-100</td>
<td>1</td>
</tr>
<tr>
<td>100+</td>
<td>1</td>
</tr>
</tbody>
</table>

1 company stated 180 employees.
MAS Applications:

Defence and marine science research featured strongly for MAS applications followed by offshore oil/gas, environmental monitoring, maritime security and renewable energy. Respondents also mentioned underwater asset manager, deep sea mining and fishing and aquaculture.

Market Activity:

Defence was the largest main market sector in 2016 with 37% of Companies citing it, closely followed by oil/gas (24%). It is interesting to note that whereas 25 companies claimed this to be a market sector they supply, only 6 companies cited this as their main market. Overall there appears to be little difference between the sectors such as renewable energy (2%), maritime security (5%) and environmental monitoring (7%).
Export markets

More than 70% of responses cited Europe (excluding UK) as the main market destination which could have implications for future growth in this region depending on the eventual trading relationship the UK negotiates with the European Union. There was a fairly even spread across the other regions of the world with the USA/Canada, the Middle East and Asia-Pacific having a similar importance for companies.

Companies were asked to give the main region in which they trade and somewhat expectantly for a nascent industry the answer was the UK [Figure 10]. Europe and USA/Canada were mentioned as the main regions for exports but in reality there aren’t huge variations between the regions which
Factors that have had an effect on Business

The main factor that has had both major and minor effect on business has been the dramatic fall in oil prices and this was closely followed by lack of finance. One respondent commented that there was no mechanism for start-up companies to attract R&D support for disruptive technology. Whereas, academic institutions can gain 100% funding for such activities, small innovative companies are left with crowd funding and sponsorship, meaning that the playing field is not even. One problem with Horizon 2020 funding was that without a trading track record and around 40% of the project self-funded it was almost impossible to qualify. One interesting issue emerged from the comments and that was the restriction now applied on the transportation of lithium batteries, which had the effect of substantially increasing freight costs.

Figure 11: Negative effects on MAS Business
MAS Employment Growth:

As seen from figure 12, a total of 0-5 employees working on MAS projects in 2020 is the general consensus from most companies. However, some companies think that it is more likely to have 41-60 employees than 21-40 employees. The question of how many employees will be working on MAS projects in the future is much based on confidence. More importantly by 2020 there maybe factors that are out of our control which will have an impact on a given companies employment rates and their ability to employ new staff.

Looking to the future, how many employees could you foresee working on MAS projects in the year 2020?

![Figure 12: Future Employees in MAS Projects by 2020](image)

1 company stated 250-300.
1 company stated 150.

A BAS glider in the Antarctic

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