

Marine methodologies technology for geophysical and geotechnical acoustic surveys



Institution: WiMUST
Country: Italy & The Netherlands
Type of partnership: From the Horizon2020 program
Website: <http://www.wimust.eu/>

Background

The WiMUST project was developed by a consortium of nine private and public partners led by the Interuniversity Center of Integrated Systems for the Marine Environment (ISME). Founded in 1999, ISME is a network of nine universities that aim to support research activities in marine technologies and oceanic engineering. The universities that make up ISME are distributed across Italy. The main research topics covered by ISME are:

- Marine robotics
- Underwater Acoustics, Communication and Networking
- Renewable Energies
- Modelling and Simulation

Specifically, The aim of the project was to develop co-operative autonomous marine robots, which act as intelligent sensing and communicating nodes of a reconfigurable moving acoustic network.

Story

The WiMUST project was funded under the Horizon 2020 Framework Programme under the Research and Innovation Action (RIA) scheme. The project started in 2015 and lasted until 2018 when the final experiment took place. In 2016 WiMUST won an award at the IEEE International Conference on Robotics and Automation for the Best Field Marine Paper.

Stakeholders

The WiMUST project consortium is made up of nine partners across Europe, bringing together a group of **research institutions, geophysical surveying companies and SMEs**. Each partner has knowledge in the field of sensing technologies and robotics.

The **management structure** of the WiMUST project includes a Project Advisory Board made of three international experts in the field. The role of the PAB is to provide independent scientific advice relative to strategic decisions regarding the overall WiMUST system and its application.

“The WiMUST consortium expects that the use of autonomous robots for recording seismic data at sea will find widespread applications.”

Resource needs

In the case of WiMUST, laboratories were needed to undertake the project, as well as knowledgeable researchers and practitioners in the field of sensing technologies and robotics.

In terms of supporting mechanisms, from ISME’s point of view, the templates for IP agreements provided by the European Union for the projects were particularly helpful in terms of navigating the IP process.

On a general note, both interviewees agreed that SMEs without specific experience with EU projects need training and assistance especially in terms of the administrative activities that need to be undertaken for the project. This could be someone from the Horizon programme contacting SMEs, advising and talking them through the project.

Also, large amounts of time needed to be set aside to meet and discuss integration activities and both interviewees agreed that SME partners should be made aware. Thus, the assisting person could be helping SMEs to prepare administratively.

From an SME representative’s point of view, having a lower-level contact at the European Commission that would be able to answer simple queries, would reduce the time it takes to resolve any issues that arise.

Outputs

ISME co-ordinated the project as a whole and was responsible for the successful integration of all the components of the project. Geo Marine Systems Services worked in collaboration with the academic and private partners to develop the technology for the project.

WiMUST developed a system made of cooperative autonomous marine robots, which acts as intelligent sensing and communicating nodes of a reconfigurable moving acoustic network.

This technology drastically improves the efficacy of the methodologies used to perform geophysical and geotechnical acoustic surveys at sea. A few of the partners have continued to work to apply the technology in their own capacity and once all technical hurdles are overcome, the WiMUST consortium expects that the use of autonomous robots for recording seismic data at sea will find widespread applications.

Through WiMUST, partners introduced each other to their different ways of planning projects and working together. Partners learned a great deal from one another in terms of knowledge sharing on the topic and project management skills. Through the funding received during the project, the academic partners were able to hire new researchers.

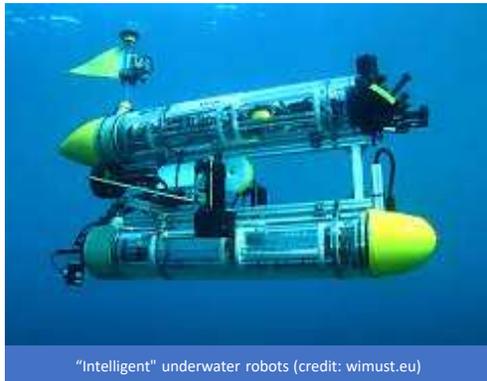
Public funding for basic research is generally limited, and it would not otherwise be possible to employ PhDs and post-doctoral students. EU-funded projects allow for this extra capital which can help hire early-career researchers that are not yet established.



Vehicles used in the WiMUST trials (credit: <http://wimust.eu/>)

Motivations

1. From **both the HEI and SME side**, the drivers to apply for funding and to take part in EU-funded projects include the benefits of working in a cooperative project.
2. The **HEI representative** found that when the SMEs were given a clear mandate from their partners on what was required from them also made joining the project less daunting.
3. **Partners** need the right skills for the project, and it is also valuable to find partners with a track record of success in previous projects. These partners should be committed to the project and its outputs.



"Intelligent" underwater robots (credit: wimust.eu)

Barriers

1. The **outsourcing of staff** by SMEs may cause complications, especially when the partner representative lacks a contract.
2. The HEI representative found that the **amount of administration** required to apply for funding may also be intimidating to SMEs. Thus, SMEs often need support from partners that have participated in EU-funded projects before.
3. The fact that the project does not allow the **budget to be transferred between activities** very easily, can be frustrating for SMEs that have not had experience with EU-funded projects before. In an SME such as Geo Marine Survey Systems, budgetary controls in project plans and their approval are usually not used, and thus using these controls in EU-funded projects may be a challenge for them.
4. In terms of **information**, SMEs may be uncomfortable sharing their background information to be made public.

Key success factors

1

Close community

The community of marine robotics in Europe is relatively small and thus those involved in the field are often aware of one another.

2

Mutual support across activities

Working together to integrate the activities, instead of working separately and then attempting to put them all together.

3

Familiarity with technology

The SME partners had already mastered the technology being used and the consortium just had to apply their knowledge/equipment for the project's purposes.

A successful end to the WiMUST project (credit: wimust.eu)



"WiMUST developed a system made of cooperative autonomous marine robots, which acts as intelligent sensing reconfigurable moving acoustic network."

Author: Catherine Hayward, Project Officer & Alexandra Zinovyeva, Manager Research Projects at UIIN

Interviewee: Giovanni Indiveri, Director of ISME and co-ordinator at WiMUST & Elbert Kelhol, Director Electric Design at Geo Marine Survey Systems