D10.11–Summary of Advisory and Stakeholder Board (ASB) Recommendations

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SECTION FRANÇAISE DE L'INSTITUT DES INGÉNIEURS ÉLECTRICIENS ET ÉLECTRONICIENS (IEEE)

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Deliverable D10.11 Summary of ASB Recommendations

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Abstract

Deliverable document D10.11, *Summary of ASB recommendations* highlights the contribution of the Advisory and Stakeholder Board (ASB) members to the NeXOS project. Starting with ASB members identified during the proposal phase, NeXOS progressively included selected ASB specialists to answer specific needs of the project. These selected ASB members participated in NeXOS General Assemblies (GA) as appropriate and provided feedback to the project coordinator and others by the end of the GA. The ASB task was co-lead by WP11 (Management) and WP10 (Dissemination and Outreach).

Table of content

1 Introduction

WP10 is co-leading the Project's Advisory and Stakeholders Board (ASB) with WP11. Internationally relevant members have been carefully selected for their roles in stakeholder communities, and invited to join the Board during the proposal stage. Further members have been invited as appropriate during the various phases of the project. From the beginning of the project to the first checkpoint report (CPR), the following members participated in ASB meetings: Patrick Farcy (Ifremer, Science Direction, JERICO and JERICO-NEXT Coordinator), Svein Rune Smådal (Havila Shipping, Norway), and Doug Au (Chief Engineer, MBARI, USA). Since then, the following ASB members participated at the Toulon General Assemby: Clara Hulburt (Teledyne, USA), Victor Turpin (UPMC, France), and Philippe Courmontagne (IM2NP/ISEN, France)

The members provided advice on requirements, interface of sensors with platforms and brought a knowledge base of emerging technology and applications. As important, they reinforced lessons learned from their years of research and field experience.

2 ASB tasking

The ASB provides independent external advice on scientific, technical, legal and economic issues relevant to the project. It enhances information exchange, shares good practice and issues feedback on the feasibility and adaptability of NeXOS developments.

The ASB contributes to the dissemination of project results to the relevant communities and actors in ocean observation, marine and maritime monitoring, fisheries management and other relevant marine/maritime activity sectors. The ASB provides valuable business guidance in order to increase the potential commercialization of the final products/developments. The participation of representatives from EU institutions and international organizations fosters an exchange of information between the Steering Committee (SC) and representatives of international S&T programs and projects.

The ASB reports to the SC within the framework of the project General Assembly (all partners) meetings. Participation is primarily by electronic means. In-person meetings are scheduled for selected representatives of the ASB, coincident with project General Assembly meetings.

Each external participant to the Advisory and Stakeholder Board was requested to sign a Non-Disclosure Agreement before any confidential information could be exchanged.

3 ASB Meetings

The following face-to-face meetings were conducted.

3.1 NeXOS Kick-off meeting – ASB Gran Canaria, 31 October 2013

Patrick Farcy (JERICO), and Svein Rune Smådal (Havila Shipping) participated in the NeXOS Kick-off meeting as ASB members. A short meeting with them and some of the team was scheduled towards the end of the meeting, on Thursday 31st of October from 16h00 to 17h00, in order to collect their comments and input as advisors.

3.2 NeXOS 5th Ordinary Project Meeting – ASB Villanova I la Geltru, 28 October 2015

The Advisory and Stakeholders Board Meeting was held on October 28th, 2015 as part of the 5th General assembly. The meeting focused primarily on Sensor-Platform integration. ASB representatives were Doug Au, Chief Engineer at MBARI, and Patrick Farcy, Ifremer, coordinator of the JERICO project.

ASB session:

Chair: Jay Pearlman, Co-chair: Eric Delory

- Introduction (Eric Delory)
- OGC-PUCK Protocol toolkit (Joaquín del Rio)
- Sensor-Platform integration experience
    - MBARI (Doug Au)
    - JERICO (Patrick Farcy)
- Discussion on NeXOS sensor integration (moderator: Jay Pearlman)

Doug Au's presentation can be downloaded from this link; Patrick Farcy's presentation can be downloaded from this link.

3.3 NeXOS 7th Ordinary Project Meeting – ASB Toulon, 5 October 2016

The Advisory and Stakeholders Board Meeting was held on October 5, 2016 as part of the 7th General assembly. The meeting focused primarily on Platform integration. ASB representatives were Clara Hulburt, Teledyne; Victor Turpin, UPMC, GROOM; and Philippe Courmontagne, IM2NP/ISEN.

ASB session:

Chair: Eric Delory, Co-chair: Jay Pearlman

Slocum G3 glider and sensors integration

Speaker: Clara Hulburt, Teledyne. Presentation can be downloaded from this link.

Data management and ocean observing system

Speaker: Victor Turpin, UPMC. Presentation can be downloaded from this link.

Passive acoustic process and signals interpretation

Speaker: Philippe Courmontagne, IM2NP/ISEN. Presentation can be downloaded from this link.

In addition to the ASB activities above, there were three NeXOS workshops that engaged the stakeholder community. A summary of the stakeholder participation and topics covered is provided below. For additional details, consult deliverable D10.3 compilation of NeXOS workshops 1 to 3 proceedings.

Workshop 1 Stakeholder Engagement - Runde Norway April 1-3, 2014

The stakeholders focused on sensor requirements for the shipping, oil, and marine industries in Day 1, and addressed the fishing industry on Day 2. These were detailed discussions of the NeXOS sensors and the implementation opportunities for ocean natural resources.

Workshop 2 Stakehoder engagement – Oceanology International. OI 2016 is the leading international event for Ocean related hardware and software activities and it includes the presence of both Scientific and Business communities. During the three days of the OI2016, OoT projects, including NeXOS's partners had the opportunity to show the current progresses on sensor developments and transversal innovations. Demonstrations took place each day at the tank of the Ocean of Tomorrow booth, showing the capabilities of the O1, A1 (Optical and acoustic sensors) and Sensor Web Enablement. It was a great opportunity to interact with international stakeholders from research and business areas, with the objective to better understand their needs and shaping the marketability of our future products.

Workshop 3 Stakeholder Panel Aberdeen Scotland June 22nd, 2107

Stakeholder participation included:

1. Applications Panel	Organization	Areas of interest
Gareth Davis	Aquatera	Marine Energy
Gordon Drummond	SubseaUK	Technology for subsea environment
David Green	University of Aberdeen	Marine and Coastal Zone Management
David Murphy	AquaTT	Knowledge Transfer for Impact
Iain Shepherd	EC DG Maritime Affairs & Fisheries	Environment/Fisheries
Tom Williams	Institute for Marine Research	The Reference Norwegian Fishing Fleet

A list of questions was provided to the participants to be considered in their discussions:

- what are the key challenges for ocean observation in your area of interest;
- if we could improve the measurements, what difference would it make;
- what is the first application we should consider;
- what is the future vision, what path are we taking; and if anyone has a sense of it, what is the potential market size and timing and who are the customers.

The detailed responses are provided in the deliverable D10.3 compilation of NeXOS workshops 1 to 3 proceedings.

The recommendations are summarized below in Section 4.

4 Recommendations

4.1 Sensor/platform Interoperability

Doug Au talked about MBARI's development of the OGC/PUCK protocol, and the current situation regarding implementation in gliders and other devices. He and Patrick Farcy strongly supported the PUCK and SWE implementations, viewing them as critical capabilities for large-scale oceanographic instrumentation networks. The impacts are lower cost of maintenance, calibration, qualification and operation. They will enable new ways of observing and monitoring the future oceans. On the other side of the user chain, Patrick recognized the NeXOS work in SWE and said that JERICO NEXT and Ifremer both recognize SWE as an important capability supporting interoperability for users downstream the data centers: to publish data collections, for download with subsetting or advanced visualization in web portals. Ultimately SWE must be engaged along the long data path to SeaDataNet, Copernicus Services and Emodnet.

The path forward is not easy. As Doug noted: "You need to prove utility every step of the

way through demonstration." Patrick offered recommendations in two areas relating to sensor integration. Often integration is not possible, because different types of data-flows are not compatible without an overarching integration and communication approach. With some spectral sensors the difficult issue in integration is the serial communication protocols/commands/data formats are not easily resolved. Typical difficulties with factory-made "central logging systems" is the low connectability for instruments providing atypical data (spectra or kinetics), low ability to change visual display to include new multidimensional data. The bottom line was that NeXOS must address the end-to-end data and information challenges including implementation in the field and the uptake of users in the observation and modeling communities.

4.2 Transition from research to commercial applications

Ultimately the success of NeXOS does not only consists in its technical achievements, but also in its ability to set directions for adoption of the sensors and the systems approach by the stakeholder community. The ASB meeting in Toulon addressed this subject. Clara Hulburt of Teledyne indicated that in selecting sensors for adoption, they look for peer reviews within the community, such as technical papers. Philippe Courmontagne suggested community engagement by comparing the new sensors with current baseline sensors; and then giving examples of the data collected by the sensors to the science community or as part of a scientific communication such as the Journal of Oceanic Engineering (e.g., a special issue on NeXOS); he also recommended providing access to real acoustic data to students at his institution.

With respect to uptake, the ASB members recommended the following:

Philippe advises that the bio-fouling protection developed by NeXOS may be lost at the end of the project because of the way it will be implemented. This should be addressed.

Clara feels that the applications most likely to move forward using gliders would be as follows:

- for acoustics Mammal classification, detection and tracking; and sound scape;
- for optics, oxygen.

4.3 Other considerations

The following quotes are illustrative of the key concerns of the stakeholders attending the Aberdeen workshop (IEEE Oceans 2017 conference) and should be of particular interest to sensor developers:

For oil and gas, the key challenge is the movement to ever-deeper water (2000 to 4000 meters,

far off shore). In order to price structures, they need to know the weather and the behavior of the sea. Improved measurements would vastly improve pricing.

Applying the resources of the Norwegian fishing fleet to ocean observations would really provide benefits and reduces cost. They collect data once and use it for many purpose. When you use that strategy, what becomes hard is to decide what to collect.

For the marine strategy (MSFD) descriptors, lots of data are missing. There are gaps and technological solutions we are working on, and we hope that there is convergence in interests, leading to increased cost.

The European Commission is looking for the value proposition for research investments. That is driving a focus on how to measure value creation for research. What are the processes in the life cycle to improve, optimize and get better results from research investments?

There is a tendency to think that the newest technologies are the key to the marketplace. The stakeholders noted that mature and reliable technologies can be more important for practical operations.

Autonomous observing is important so that production users do not have to focus energy on sensors as they carry out operations.

5 Conclusion

The ASB gave substantial support to the directions that NeXOS was taking. NeXOS innovations are in key areas and gaps in observation system capabilities – from improved interoperability to small sensors with low power consumption. Improvements in applications on autonomous vehicles such as gliders will have large impacts. For the fishing and energy/mineral production organizations, robustness of sensors is a priority. Integrating some of the Sensor Web Enablement (SWE) and software into the community and transition of these developments into other projects should be a priority. The approach of working with small and medium enterprises looks excellent and should be maintained throughout the project life.