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Planning highways in the sea

We are repeating the efforts of our ancestors in reaching out to the sea for our livelihood, not exclusively on boats this time, but on highways connecting data and people, leading to technology-enabled futures, says **Prof. Aldo Drago**.

New concepts that are traded to be innovative are often nothing else than a re-shaping of much older notions that are cooked up from the past and given a different flavour and outlook.

In the hands of a trained designer, a derelict house of character may be transformed into a top selling property that links the legacy of an older architecture to the bloom of modern constructions. It is the same with breakthroughs in science, medicine and other realms that may be perceived to stand out as distinctive achievements, whereas in reality they are the summit of previous ground theories and founding attainments that gradually build towards something majeure. Would Einstein think of special relativity theory if Newton had not set the basic principles of motion two centuries earlier?

Perhaps this is how things work in all aspects of life, our mutual dependence, our intricate linkages that bind us into families, groups, factions, crowds and into



Data never becomes obsolete, but its value depends on its consistency, continuous updating, interoperability and open access to multiple users. PHOTO: SHUTTERSTOCK.COM

what we call society in general. In different ways we all depend on one another, building on common successes or falling under collective failures. Each of us distinct, but every individual forming part of a larger entity like molecules composing one volume of gaseous material.

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different ways

But where are these thoughts leading us to? How does this concern the sea? Highways in the sea expressed in the title is a metaphor implying how the marine-based and maritime industries are expected to drive these economic sectors to excellence in the coming decade.

According to the OECD Ocean Economy report for 2030, the global ocean-based economy in 2010 (taken as the base year) stood at \$1.5 trillion in value added, accounting for 2.5 per cent of the world GVA. Ocean-based industries have the potential to outperform the growth of the global economy as a whole, and are expected to double by 2030 even in a business-as-usual scenario. Strongest growths are mainly foreseen in marine aquaculture, offshore wind energy, fish processing, and shipbuilding and repair, with correlated important contributions to employment growth. The report analyses the economic

perspective of the ocean economy while meeting the goals of a more sustainable development, and provides policy recommendations to support such national and international efforts.

Naturally, Europe targets to get a good slice of the cake. The coastal oceans, including coastal zones and offshore and open coastal waters, are important economic zones and key areas for Blue Growth. In Europe, a third of the population lives within 50km of the coast, and GDP generated by this population is estimated to exceed 30 per cent of the total EU GDP. The annual economic value of coastal areas within 500m of the European shores is valued in the range of \$0.5 to \$1 trillion (European Commission,

http://ec.europa.eu/environment/iczm/state_coast.htm). The Mediterranean Sea itself hosts 150 million people living on its coastal areas, and handles 30 per cent of the global sea-borne trade volume.

Throughout history this sea has played a crucial role in the socio-economic development of the region and its riparian countries. Naturally, Malta has a clear maritime legacy. The sea surface area around Malta contained within just the 25 nautical miles offshore limit, is already at least 20 times more in extent compared to the land size of the islands – this ratio is by far superior to any other European country, and constitutes a resource advantage for alternative energy exploitations, aquaculture, marine biotechnology, maritime transport and many other activities underpinning the economy.

We are therefore nothing but repeating the efforts of our ancestors in reaching out to the sea for our livelihood, not exclusively on boats this time, but on highways connecting data and people, leading to technology-enabled futures. In essence it repeats the longstanding quest to achieve

economic excellence which remains, as it was in the past, the persistent endeavour to discover and target new niches, exploiting innovative ideas, reaching achievements before others, and taking advantage of knowledge or resources that have not yet been tapped or accessed by competitors. Only that this time the scenarios, the challenges and the approaches have evolved, are dynamically and constantly changing, and much more intricate to handle. The lanes have become highways.

The notion of highways appears appropriate. Highways because there is so much road to thread with streams of big data, busting high performance computing, cloud computing and data analytics creating and composing traffic, the Internet of Things (IoT) and machine to machine communication automating flows, and artificial intelligence pumping more fuel into motion. Highways, because the bandwidth of opportunities is so wide and spread, providing new approaches to knowledge creation and smart technology-driven journeys. So it is about data, connectivity and people, the mix of ingredients that make up the recipe and bring the taste of economic excellence.

Of course, we would need to adopt science-based safe and sustainable thresholds for economic operations under changing environmental and social conditions. It is also about harnessing economic excellence to intelligently, cautiously and sustainably make use of resources that are retained intact to future generations. To achieve this, it will definitely require a new culture of professionals that better feel and understand the pulse of nature.

Data stands to be an essential asset. Like any other asset it has to be well organised and maintained. Data never becomes obsolete, but its value depends on its consistency, continuous updating, in-

teroperability and open access to multiple users. It must trigger a multiplier effect. When a data asset matures into a resource for a number of products, it becomes an indispensable asset, namely it becomes core data and a building block of the highway.

The value of data is then proliferated when data of different nature, type, and scale are integrated to make a whole, merging lanes into a highway. This is about tackling diverse layers of scientific and non-scientific data and information streams (like socio-economic, demographic, statistical, mapping and performance data) by machine-assisted interfaces that are capable to link multi-factors for association, decision making and strategic planning at different levels and scales.

Speaking of Malta, we know how much government is lured by the prospects of taking the edge on blockchain and artificial intelligence. We can never stop reiterating how much does this rely on supporting the creation of data and knowledge, and on structuring data flows, management and governance structures for its open access and widespread use. Millions of euros are dedicated to roads as key essential infrastructure. It appears to be yet still difficult to make our politicians equally perceive how data highways are essential to sustainably make economic excellence happen.

Prof. Aldo Drago leads the Physical Oceanography Research Group (ex Physical Oceanography Unit, PO-Unit) within the Department of Geosciences of the University of Malta. The Group undertakes oceanographic research, in a holistic perspective, including operational marine observations and forecasts, specialised data management and analysis, with the participation in international cooperative research ventures.