

Collaborative innovation within the maritime sector: the path to grow back better

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Ensuring future competitiveness of the maritime industry in post-pandemic times will require making it more efficient, predictable, sustainable, and resilient. This implies a change in the recipe for capital creation of involved actors and a change in mindset to overcome industry existing legacy systems and silo-thinking. Enhanced collaboration and innovation are crucial to achieve this. Engaging the crowd in innovating ecosystems is a key ingredient of [maritime informatics](#), a discourse that unites practitioners and researchers in their efforts to improve efficiency, resilience, and sustainability of shipping.

In this article, we review [open innovation efforts](#) that have brought inspiration and pathways for new ideas to emerge to improve operational efficiency; to design and implement new business models and develop solutions for the common good. We direct specific attention towards maritime hackathons as a form of collaborative innovation. We explore the role, setup, outcomes and success factors of maritime hackathons, using the recent event in Morocco, coined as “the Smart Port Challenge 2020”.

Developing innovation capabilities through new forms of collaboration

During recent years, there has been a lot of calls for engaging the crowd in truly innovating the maritime sector. This is also urgently needed, as the majority of the 4,900 ports in the world are not yet using digital technology for even the most basic processes; [80% of ports continue to rely on manual, legacy solutions](#) such as whiteboards or spreadsheets to manage critical marine services such as towage, pilotage and berthing.

Collaboration between traditional industry leaders and startups is on the rise and maritime testbeds and accelerators have emerged. For example, in August 2019, Inmarsat, Cargotec, Shell, HHLA and Wärtsilä launched the second cycle of the [Trade & Transport Impact Program](#) in search for 10 mature startups. This innovation platform was set up to produce commercial partnerships between startups and top transport companies. Also, Singapore’s largest shipping company, Eastern Pacific Shipping (EPS), teamed up with investor and the accelerator Techstars to create a space where innovation is accelerated.

Innovation efforts are also picking up in leading ports. For instance, port and maritime accelerators, such as [PortXL](#), which originated in the Port of Rotterdam, have also surfaced in the ports of Singapore and Antwerp. New data sharing platforms, such as Perseus by [MarineFields](#) driving the [STEAM project](#) in Cyprus or [NxTPort](#) and [Port+](#) emerging from Port of Antwerp, are empowering [third-party developers to build new applications](#) associated to ports, connecting local information sharing communities to better respond to needs of the global supply chain. Physical LivingLab environments, such as the one in the [Port of Singapore](#), are allowing service providers to experiment and demonstrate solutions in authentic settings.

Innovation efforts are also enabling simultaneously reducing costs and reducing the impact of ports and shipping sector on the environment, as in the case of the joint venture between Hamburger Hafen and Logistik AG (HHLA) with [HyperloopTT](#), a [“crowd-powered” company and innovator by design](#). The goal of this collaborative innovation is to move containers at the speed of sound through a vacuum tube, an enclosed highly reliable system, connecting ports with their hinterland in a new way, reducing time and carbon emissions. Also, in Sweden, there are initiatives such as [I.Hamn](#) and [SARGASSO](#). For I.Hamn the ambition is to allow the 50 + ports of Sweden to join forces in supporting each other on their journey towards a more sustainable and resilient transport ecosystem. SARGASSO is an open innovation platform for blue growth, that engages industry clusters across domains to contribute technology to the maritime industry whilst receiving challenging maritime opportunities.

Another great example of economic and environmental co-benefits is [Cubex Global](#), a digital marketplace selling unused space in shipping containers, developed in the context of the [World Economic Forum's UpLink Innovation Challenge](#). Considering that every year, 100 million containers cross the ocean almost empty, producing 280 million tons of carbon emissions and costing \$25 billion a year in lost revenue, this digital solution allows an ocean-friendly model for shipping.

These examples are indicators that the maritime industry wants to change and that it can make progress when there is courage to open up, network and bring in external parties or the crowd to support innovation efforts.

Hackathons - a model to effectively surface ideas for innovation

Hackathons are another path to collaborative innovation. [Hackathons, in different setups, have also become more present within the maritime sector during the last five years](#). A hackathon is a popup space, offering a broader, more concentrated and probably more diverse participation in an innovation effort, focused on a number of specific use cases, often framed as challenges

The hackathon model is very effective in surfacing innovation ideas because, besides yielding great ideas, networked accelerators help capitalizing on the effort and facilitating longer-term collaboration to truly innovate and produce concrete results and returns for all contributors. [Gil Ofer, head of Open Innovation at Easter Pacific Shipping, explains:](#)

"The approach of the past within maritime was to develop new technology either internally (e.g. legacy software systems) or due to regulation changes (e.g. the double hull for tankers) and to fund these initiatives from investors within shipping.

We found that an open innovation strategy whereby we invited both the venture capital and maritime communities to take part in our goal of driving the industry forward by collectively shaping ground-breaking technology was truly effective.

The other thing that really pleased us was how deeply involved the broader maritime community became. Large swathes of the industry – shipping companies, cargo owners, port operators, classification societies – all came by to meet with the companies we had invested in. Contracts and deals naturally followed."

The Morocco Smart Port Challenge 2020

The [online hackathon Morocco Smart Port Challenge 2020](#) allowed participants from everywhere in the world to contribute without any constraints, and travel or logistics costs. More than 500 people of 30 nationalities from Africa, Asia, Europe and America participated in this open international competition. The Moroccan port community system provided the setting for this hackathon. The digital event platform with its broad set of functionalities and good ergonomics helped participants to effectively collaborate during a six-week period. This platform also helped participating teams to connect easily with mentors and experts and to consult the 25 recorded lectures at any time of their convenience. Simultaneous English/French translation was offered and helped the clarity and collaboration in diverse meetings. Moroccan professionals from different sectors, including maritime and ports, banking and finance, logistics and transport, energy and environment, and foreign trade brought diverse perspectives to solve the challenges.

The three winning solutions from the hackathon demonstrate the ability of teams to adapt to a specific context. The Morocco hackathon introduced innovative solutions that are opening up new business opportunities, while solving local challenges, such as:

1. **Fighting climate change requiring carbon-neutral energy production.** [Eco Wave Power](#) is an onshore wave energy technology company that developed a patented, smart and cost-efficient technology for turning ocean and sea waves into clean electricity. Production of energy from waves represents an opportunity for Morocco, which has a coastline of more than 2900 km on the Atlantic exposed to a large swell with port sites that could accommodate these energy production facilities.

2. **Managing high volume flows of trucks at peak times leading to congestion, delays and increased carbon emissions.** This is a big concern for the Moroccan port industry. The [DuckTheLine](#) team proposed the virtual line app, which breaks the common logic of first-in-first-out (FIFO) treatment by striking with three levels of optimization: bookings for the next day, real time waiting line and resources adjustment via a mobile app, and finally SMS instructions for those who are not equipped with smartphones.
3. **The transition to electronic payments instead of physical payment (check, cash) by increased transparency, cutting through red tape and reduced fees.** The Port Tech Payment team proposed to accelerate the adoption of electronic payment through a multi-factor analysis of user behavior and business needs, integrating innovative chat-bot based technology at a limited cost to guide the users to and through the electronic payment options.

Beyond the winners there were many other promising solutions to support ports and international trade that were presented at the event, including:

4. **LIATRUST**, offering a solution for the mutual recognition of electronic certificates of origin by customs authorities through technologies, like cloud computing, cryptographic security, data distribution as well as technological exchange standards to network the authorities in charge of issuing certificates.
5. **AQUASAFE**, helping to detect and monitor the propagation of oil slicks, to fight against accidental pollution, thanks to real time data from multiple sources and the use of an image analysis software based on artificial intelligence.
6. **HYDROMOD**, optimizing dredging work by analyzing winds, swells and currents which cause sediment to move and modify the depths and conditions of access to ports.

Bringing Moroccan universities, startups, students, and researchers together with private sector companies established a base of cooperation in applied research that goes beyond the event was a key success factor. The support of the [Global Alliance for Trade Facilitation](#) also helped mobilize networks of expertise and start-ups from abroad, providing global insights and creating international recognition of the effort conducted on Moroccan grounds.

Looking upon the outcomes of the Smart Port Challenge 2020 pursued in Morocco, many of the proposed solutions are empowering ports to become more efficient, sustainable and integrated in the global supply chain with [multi-dimensional hub capabilities](#) enabled by [Maritime Informatics](#). Moving forward, networked accelerators should help to drive adoption of the most innovative solutions, providing business opportunities and pay-offs for the participants and winners in hackathons.

Covid-19 has accelerated the digitization of global supply chain networks. If ports end up being the weak link in the global logistics chain, they risk inducing delays, unnecessary costs, late payments, increased fuel consumption and emissions, and even safety concerns stemming from a lack of traceability. Ports are thus key to enable supply chain resilience and green conversion of the global supply chain, a must in pandemic times and beyond.

In this context, innovative ideas are needed to simultaneously (i) achieve higher resource and energy efficiency; (ii) create additional value for each actor and improving the return of investment in assets, and (iii) reducing costs and the constraints that business puts upon our planet.

In a context where the gap between those ports that digitize and those that do not is rising, ports can learn from the leaders and leverage open innovation to prepare for the future. The world of ports needs more hackathons, labs, testbeds, incubators and accelerators, and more collaboration that drives innovation amongst them and towards more digitized and sustainable maritime logistics networks. This is a call for collaborative innovation action!

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