

The Evolution of Ports into Innovation Hubs: A Proposal for the Adriatic Ionian Area

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PoWER - Ports as Driving Wheels of Entrepreneurial Realm is a EU project funded under the INTERREG V B ADRION Programme. It aims at recovering the historic role of Adriatic-Ionian (ADRION) port cities as pivotal centres of development and exchanges, by stimulating their evolution into Innovation Hubs (IHs) to exploit their untapped innovation potential. IHs will strive to establish a holistic and fertile innovation environment purposed to turn actual issues and challenges into shared opportunities as well as to build on them local integrated innovation supply chains. To this extent, the project tests a methodology specifically tailored for the ADRION port cities. It stands out from ongoing trends of the IH realm for a g-local approach aimed to fully leverage on port cities energies and resources in a smart and flexible way as well as to enhance their cross-border cooperation. The final aim of PoWER is the construction of the Innovation Hubs Network, the first network of maritime IHs, where local innovation pathways are shared and merged into a transnational strategy for joint evolution and development. The project is supported by a digital platform, aimed at gathering all members of the Network and to provide them with the necessary tools to implement their strategy. The PoWER Methodology and tools are characterized by a high degree of replicability, so to offer the chance to ADRION port cities to investigate and solve heterogeneous issues in close cooperation with each other.

1. Introduction

Ports are at the origin of the development of small sea towns into powerful maritime trading cities, strongly linking port and urban life; this link has been persistent throughout history, being at the basis of many emerging economies (Merk, 2014). Since the second post-war period, the trades' globalization and containerization's rapid development leading to bigger ships, more powerful infrastructures and supporting technologies, have contributed in moving world's frontrunner ports out of their cities (Pape, 2016). Smaller peripheral port cities (such as the ones of the Adriatic-Ionian area) underwent a progressive loss of their role of lively places of commercial and cultural exchange, to which past political rifts contributed as well. This caused a lack of investments, cooperation, innovation and development, as well as a weaker application of EU policies. As a result, most ADRION ports, though being complex ecosystems and possible actors of a new development phase, suffered from low modernization rates, inadequate smartness level and unsolved issues related to sustainability and urban regeneration needs.

According to a survey of the European Sea Ports Organization, European port authorities are developing different ways to connect with their stakeholders (Pape, 2016). PoWER is empowering this trend by aiming to establish virtuous and holistic innovation environments in the ADRION port cities, i.e. Innovation Hubs, and to connect them into a wider cooperative Innovation Hubs Network (IHN). The creation of the IHN will contribute to remove inner and outer barriers to innovation, allowing to capitalize the untapped potential of the ADRION port cities and to foster the rise of an ADRION-sized innovation system. For these reasons, PoWER is a strategic

project for the Adriatic-Ionian area. It fully complies with the EU COM (2013)295, which individuates EU Ports as engines for growth, especially by supporting joint policy-making, collaborative approaches and jobs empowerment. It will integrate the Innovation Hubs Network within TEN-T nodes, as PoWER EU seaports belong to the shortlist of ports of the Core EU Network, and Durres will be a crucial node of EU PAN corridor 8. PoWER highly contributes to the implementation of the EU Strategy for the Adriatic-Ionian Region (EUSAIR, 2014) as well as for the Danubian Region one (EUSDR, 2010) and is drawing on ongoing benchmarking researches regarding efficiency (Antao et al., 2015), sustainable development and innovation (Acciaro et al., 2014) of EU seaports and also environmental performance (Seguí et al., 2016) of inland ports. Finally, PoWER is liaising with other ongoing projects funded by the ADRION Programme in order to develop shared synergic plans both for short- and long-term cooperation. Among these: BlueBoost, aiming at bridging the gap between the three helixes of the maritime clusters and trigger cooperation among innovation agents; FUTURE4, developing a Smart Learning Model for shipyard companies, which encompasses foresight activities and a dedicated platform; OIS-AIR, aimed at the creation of a “Hub and Spoke” Network for generating a critical mass for local SMEs innovation and for the design of a pilot ADRION S3 (Smart Specialization Strategy); SUPAIR, supporting Port Authorities in the implementation of low-carbon and multimodal transport and mobility solutions. As a matter of fact, there is no standard definition of Innovation Hub: it generally refers to a physical place in which proper environmental conditions (e.g. human resources, facilities, relations, organization, etc.) are set for stimulating innovation in the broadest sense. This mostly occurs along with ideas-to-business or ideas-to-market models: a process spanning from ideas generation to full market uptake, passing through incubation, mentoring, piloting, funding, growing, etc. thanks to big investments in start-ups or acceleration programs. The Innovation Hubs’ approach can be traced back to a facilitated interplay of diverse actors of the innovation supply chain – research bodies, consultancies and other service providers, industrial and financial partners, institutional subjects – managed to maximize the fertility of the innovation environment. The concept of Innovation Hub has boomed in very recent years within the EU context. EIT is fostering the creation of an integrated network of national-level IHs, intended as backbones of the EIT Knowledge and Innovation Communities (EIT, 2019). In particular, the EC is pursuing the activation, within 2021, of one Digital IH in each EU country. As for a national-scale example, the launch in 2016 of the “Manufacture 4.0” strategy by the Italian government led to the creation of a regional system of Digital Innovation Hubs (23 up to now already opened) aimed to bridge research, finance and business in the digital sector.

Within this framework, the concept of IH has been recently recognized as most proper for triggering the development of port areas while increasing their positive spillovers on cities and territories (Gras, 2019). To this extent, Europe has seen, on the one side, the rise of new national-scale IHs devoted to bringing innovation within ports and shipping industries as in Portugal (Bluetech, 2019), UK (Port Technology, 2019), or Israel (The Dock, 2019), and on the other side, the activation of local hubs as in Rotterdam (Port of Rotterdam, 2019), Barcelona (PierNext, 2018), and Taranto (Leone, 2019). Building on this background, in 2016, the PoWER team has developed an IH concept especially tailored to ADRION port cities and marked by the following features:

1. g-local: PoWER IHs are local-scaled, so to maximize engagement interaction of local actors of innovation with special reference to cognitive institutions – s. a. schools, universities and research bodies – public authorities and businesses, with the aim of stimulating the rise of integrated local innovation supply chains; the local level is then upscaled to an ADRION-level network, where the critical mass for further innovation and development pathways can be achieved;
2. smart: it features a permanently ongoing innovation process which does not need to be established in a physical place, since it follows smart localization logic, in which every action is set in the most suitable place (schools, business-support organizations, port areas, start-up incubators, etc.); in this framework, great importance is given to the digital space with the development of an ICT platform encompassing tools and guidance for the replication of the IH process;
3. flexible: it addresses the “from ideas to market” model not only by pursuing the creation of start-ups but mainly by fostering the evolution of existing businesses and solutions, by crossing them with real market opportunities and by favouring their further growth and development;
4. cooperative: by founding the first ports’ IH Network, PoWER aims at turning the features of the ADRION macro-region into a homogeneous innovation market where stakeholders can cooperate to co-create future scenarios and roadmaps and where challenges and needs can be clustered to create the basic conditions for adopting or developing shared solutions, approaches and strategies.

Such IH concept is therefore not aimed at leveraging world-class stakeholders, but at scouting and valorizing the unexpressed entrepreneurial, educational, administrative, research and social potentials embedded in local communities, which are often already at hand, but miss a place for mutual recognition and interaction, and proper process for establishing virtuous and holistic innovation environments.

2. The PoWER Methodology

PoWER tests and validates a tailored approach for the construction of innovation supply chains, addressing the needs of six pilot ports: Bari, Brčko, Durres, Igoumenitsa, Ravenna and Rijeka; the tested approach will be then turned into the PoWER Methodology for the evolution of ports into Innovation Hubs, characterized by a high transferability level. Energy - as one of the main indicators of environmental sustainability of a port (EcoPorts, 2017) – is the project's topic; nevertheless, it is possible to apply the PoWER Methodology to any other topic of strategic interest for ADRIAN ports. The main project outputs will be achieved in three phases (Figure 1).

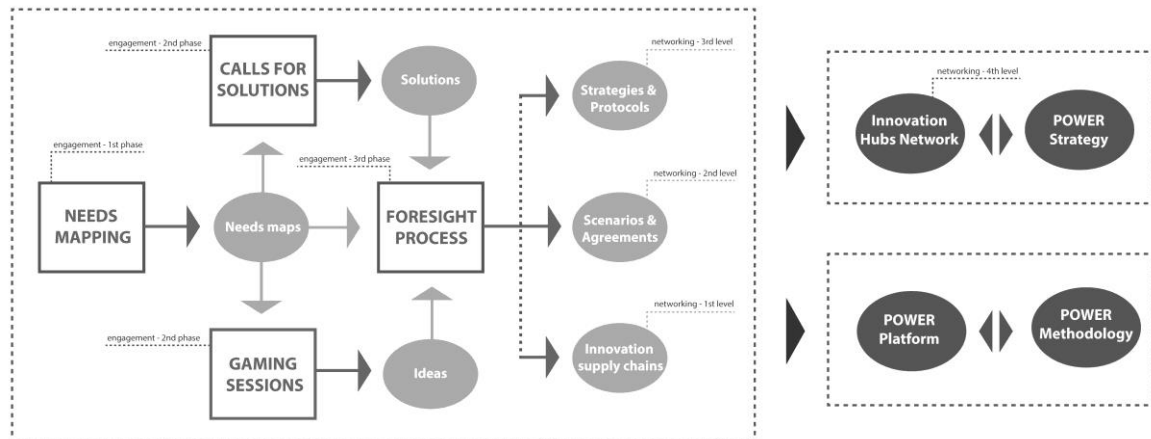


Figure 1: PoWER Methodology scheme

2.1 Needs mapping

Energy-oriented issues are basically analysed; a structured analysis shall then be carried out for each target port according to the following steps:

- meetings with key-actors of the target area to outline grounds and goals of data gathering and to plan a working time-table (planning);
- collection of data through dedicated questionnaires, interviews, workshops and on-the-spot checks of the area involving local key-actors/stakeholders; they are classified at different levels:
 - quantitative, including statistics describing the chosen topic and investigating critical points, e.g. how much, where and how energy is used within the area, leakages, etc.; available port authorities' databases can be used;
 - qualitative, identifying critical points, needs and opportunities by means of interviews and group discussions; more than one area being interested, the outputs must be streamlined in order to achieve coherence and comparability among the different areas under study;
 - behavioural, identifying stakeholders' behavioural patterns emerging from the quantitative and qualitative analysis and their grounds;
- deep data gathering and on-site measurements, after the identification of critical issues;
- smartness assessment, i.e. evaluation of the port's current performance with regard to infrastructure and equipment, processes and expertise (operational, energy and ambient management) enabling the identification of the strong and weak points of the port. A dedicated structured and detailed questionnaire has been developed.

A final clustering will integrate and homogenize local needs' lists into an inclusive one to enhance market opportunities and commitment from decision-makers and stakeholders.

Once the needs list is commonly agreed among all local contributors, each need is geo-referenced in order to be linked to one or more ports under study, leading to the generation of digital needs maps on the platform.

2.2 Ideas and Solutions Scouting

The second step aims at finding innovative solutions and ideas addressing the detected needs; it foresees three different and integrated activities: Call for Solutions (C4S), Gaming Sessions (GS), and Matchmaking.

C4S supply new solutions and patents answering to the needs that emerged from the needs mapping; it is open to independent professionals, researchers, SMEs with legal or operation seat in the area of interest. Proposals are submitted by describing i) ideas to be developed and prototyped; ii) prototypes or patents to be marketed; iii) products or services already on the market. Ports can launch periodical calls or a permanent open call. Proposals undergo a two steps evaluation: from a local jury made of experts from the same country of the

proposer - who select the best local solutions – and from a transnational jury with one representative of each local jury, who select the best solutions among the ones which have passed the local evaluation.

GS engage high-school and university students to find new business ideas answering to the emerged needs. They simulate a business game where students, supported by teachers and experts, play the role of entrepreneurs: besides contributing to PoWER implementation, gaming sessions are an innovative way to spreading the business culture in secondary schools and universities, facilitating connection between schools and professionals/ entrepreneurs, providing young people with knowledge, motivation and soft skills such as team-work, deadlines management, problem-solving capacities, etc. The ideas generated undergo a local and transnational evaluation, just as the solutions coming from the C4S. Gaming sessions are structured as follows:

- the facilitator presents the needs and the mapping method to the students to stimulate their business ideas, which are drafted in a dedicated template (content analysis);
- the facilitator describes the emerged business ideas so to have the students clustered around the ones they find more appealing, thus making teams playing the role of entrepreneurs;
- the facilitator and available entrepreneurs and consultants lead each team to develop its idea and draft a business plan through a dedicated template;
- students prepare a 10 min presentation of their idea for a public event organized by the schools;
- a local jury evaluates the business ideas and selects those to be sent to the transnational jury.

Finally, matchmaking is devoted to matching the set of detected needs with the set of selected ideas and solutions. Stakeholders from target ports are involved in two dedicated transnational events, structured in i) a working seminar where European stakeholders participate as speakers to stimulate discussion on the reference-topic among all participants; ii) an exhibition to present the PoWER Methodology, needs and port areas so to stimulate discussion; iii) matchmaking sessions to consolidate the innovation supply chains by matching demand side (ports), supply-side (business and research) and creative side (ideas).

2.3 Scenarios Foresight

Foresight is a trans-disciplinary activity belonging to the so-called Future Studies, i.e. studies based on the prediction and analysis of future horizons, able to examine the long-term impact of policies and technologies and to anticipate emerging social challenges (Di Pasquale et al., 2015). The scenarios foresight method adopted by PoWER as the third step of its Methodology aims at preparing the ground for future actions to be taken in order to renovate the port areas according to their needs, so to turn them into Innovation Hubs. The PoWER foresight method is structured in five phases (Van Woensel, 2015):

- Preparing the ground: Benchmark analysis related to the topic chosen for implementing the PoWER Strategy; the benchmark shall act as a comparative model and feed the next phases of the foresight workflow; the benchmark should cover historical trends of the issues related to the reference topic actually affecting the ports under study, published literature on the Innovation Hubs' attributes and European standards on the management of the reference topic.
- Horizon scanning: This phase foresees the study of scientific literature leading to a benchmarking analysis on ports' needs and future scenarios; a SWOT analysis shall also be carried out for each target port area, and a dedicated horizon questionnaire shall be submitted to the stakeholders who participated in the C4S and in the GS; finally, a preliminary analysis shall provide a description of a possibly undisturbed evolution of target port areas on the basis of actual trends.
- Envisioning: A Delphi Panel shall be appointed for each target port area, it shall be made by experts on technical issues related to the reference topic according to the STEEP framework (Social – Technological – Environmental – Economic – Political); the panel shall draft possible future scenarios, spanning from a short-mid to a long term, by adopting the Delphi technique. The final Delphi report will be prepared by the facilitators and will feed the following foresight phases.
- Scenarios development: this phase capitalizes the previous project activities in order to produce short-mid-term energy-oriented scenarios regarding the evolution of the target port area(s) into an IH. Such scenarios will be co-created by local thematic committees, composed by the members of the foresight panels together with local stakeholders, thus possibly guaranteeing the effectiveness of the provisions and of the related implementation measures. The aim is to develop several exploratory scenarios providing a number of plausible alternative futures, acting as a predictive tool to better manage possible risks and to converge on the most plausible actions to be undertaken in the short run in order to foster the scenario implementation.
- Strategy co-design: this phase is dedicated to the development of longer-term strategic visions in which strategic topics other than the energy-oriented ones will be investigated so to foster the evolution of the ports into Innovation Hubs. These scenarios will be co-designed by local strategic committees composed by the members of the foresight panels and local stakeholders; they will explore mutual synergies and

opportunities among different topics, possible multi-actor dynamics and policy choices as well as articulate a possible roadmap for the realization of these strategic issues. Thematic scenarios will act as the strategy's short-term layers aimed at defining proper thematic implementation conditions. The final aim of this phase is to have relevant local stakeholders formalizing their commitment to the implementation of the local strategy according to the agreed scenarios.

These steps will enable the Innovation Hubs Network to produce a joint PoWER Strategy for evolving ADRION ports into Innovation Hubs, in which activities carried out at the local level will nourish a common and integrated roadmap where priorities (following a g-local approach) and implementation measures will be defined with the aim of meeting territorial needs, regional RIS3 as well as EUSAIR's main objectives. Within this framework, the PoWER foresight methodology is fully functional to the overall innovation process pursued by the project. The further integration of foresight and networking activities is currently under test in the ongoing activities within the target ports.

3. The PoWER Platform

The PoWER platform was designed to foster the dissemination of the PoWER Methodology across the ADRION port cities and to guarantee the replicability of the PoWER Strategy by supporting the implementation and the sustainability of the activated innovation process. Its architecture mirrors the main steps of the PoWER Methodology: the needs map section provides geo-referenced information on PoWER ports, their smartness level and their needs; scouting sections are dedicated to C4S proposals submission, Ideas & Solutions storing (winners of the Calls for Solutions and the Gaming Sessions) and to matchmaking events; a foresight section (Raford 2015) offers to the wide public the PoWER Methodology's and Strategy's documents, the developed scenarios, as well as follow-ups on the implementation activities and results.

4. Conclusions

As referred in (SRM, 2018), "A new phase of portuality has begun, a new 5.0 perspective where the port must be able to implement strategies aimed not only at attracting traffic but also at innovating and internationalising the territory. Other aims have to include support and collaboration with research and training." The PoWER Methodology presented in this paper strives to accomplish this challenge with regards to the Adriatic-Ionian area by establishing a permanently ongoing, collaborative and immaterial innovation process within ADRION ports – namely the PoWER Innovation Hub – and by clustering such IHs into a transnational network.

Such a process was tested and blueprinted in this project with reference to energy-related issues but is intended as a more generally valid architecture to be applied to all the strategic issues affecting the future development of ADRION ports. In particular, by sharing existing facilities and basing on the extensive use of ICT tools, PoWER IHs are structured in order to minimize the efforts required for setting-up disruptive innovation environments in port cities. They are also aimed not only to generate or attract new innovative enterprises but also to favour the evolution and growth of existing ones by matching skills and solutions already available with concrete opportunities coming from port areas and by nurturing a favourable climate for innovation which also includes the spread of a new entrepreneurial mindset. Further contribution to these results is given by the engagement of all the potential actors of the innovation process in the co-creation of future scenarios by means of thorough foresight processes where both short and long term are investigated with the aim of reaching a wide convergence of objectives able to turn the innovation of ports into a real community challenge.

Such an outline allows to discern the main novelties of the PoWER approach respect to the actual trends in the IH realm, mostly connected to the ambition of de-fragmenting the innovation supply chains both at local and at cross-border level according to a methodology specifically tailored on the ADRION ports, which are small-scale realities endowed with a high embedded and untapped innovation potential. Such defragmentation action, by systematically leveraging on social innovation, learning-by-doing and collaborative practices, aims at overcoming the department thinking which is typical of the traditional, rigid subdivision of institutional or operational roles, so to positively affect the integration of ADRION ports with their cities and surrounding territories and thus to turn them into new driving wheels of a larger scale and inclusive development. To this extent, the PoWER Methodology, thanks to its high transferability, is meant to be replicated throughout the ADRION area, so to widen and strengthen the Innovation Hubs Network, but also to be translated as a reference best practice for fostering ports innovation within other European Macro-Regional areas.

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