



Technologies and Innovations for Improving Performances of Logistics Operators: The Techlog Project

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Introduction

Analyzing world maritime flows, the Mediterranean Sea is playing an increasingly central role in the world scenarios of goods transport and logistics: from 2006 to 2021 maritime traffic in the Mediterranean increased by 108% and today the Mediterranean area is involved in at least 12% of the worldwide maritime flows (Notteboom et al., 2019). In fact, the whole Med area has a strategic role related to its key positioning along the major East-West trading routes that linked all most important world freight markets (regarding Atlantic, European, Asian and African areas). About 40% of worldwide-containerized trade flows is handled by Mediterranean container ports and between 2010 and 2020, the total container volumes in Med area increased about 46% (UNCTAD, 2021).

Despite this quick development, some elements threaten the primary role of the Mediterranean in the scenario of world maritime traffic flows: the arctic route represents, alas due to global warming and climate change, a possible and increasingly capable route to significantly reduce the connection time between the Far East and Central Europe; the recent blockage of the Suez Canal has highlighted how it could become a real bottleneck for the development of the Mediterranean Sea, thus, stimulating the identification of new routes (Fancello et al. 2021).

The constant and continuous growth of ships sizes (naval gigantism) is restricting access to only a few

Mediterranean ports that are equipped to receive large vessels. This means that the Mediterranean, if it is to remain competitive, will have to prove not only that it has transport infrastructures suited to the demands of shipowners, but above all working and cargo handling standards consistent with what the market requires, adequate to the highest levels of safety and competitiveness (Fancello et al. 2022).

Therefore, in order to adequately respond to this rapid evolution and to be able to play a leading role in the future scenario of world maritime traffic, all the Mediterranean countries must present themselves to the outside world as a single and united area, in which working standards are as common as possible, the operating characteristics of all transport systems must be standardized and high at the same time, and the quality of logistical performance must be such that it attracts traffic compared to competing areas (the Red Sea area, ports on Atlantic Africa and above all the Northern Range).

In order to achieve this scenario, ports, logistic operators and all the subjects involved in Mediterranean transport chains need to define univocal training and specialization standards so that permanent networks can be created between ports and logistic operators within the Mediterranean area in order to strengthen its competitiveness (Kaliszewski et al., 2020). This process can be reinforced also involving research

centers and universities, logistic operators, ships owning companies, and other transport subjects inside some collaboration clusters, where innovation and technological supplies meet enterprises' needs.

Overall aim of "TECHLOG" project

TECHLOG is a project funded by the EU under the call for strategic projects of the ENI CBC Med Programme 2014-2020: as known, ENI CBC Med Programme (before 2014 it was called ENPI) is a specific EU programme finalized to improve cooperation between Mediterranean countries, particularly promoting activities between northern and southern shores. The ultimate scope is to create a competitive and strictly connected Mediterranean area both by economic, social and political points of view. Five are the countries involved: Italy, Egypt, Lebanon, Spain and Tunisia, well located in the whole Mediterranean area. Nine partners from these five countries are involved: two from Italy, CIREM by Università degli Studi di Cagliari (Lead Beneficiary and project Coordinator) and Camera di Commercio Industria Artigianato e Agricoltura della Maremma e del Tirreno; three from Egypt, Arab Academy for Science, Technology & Maritime Transport, the Confederation of European Egyptian Business Associations and the Federation of Egyptian Chambers of Commerce - Alexandria Chamber; two from Tunisia, the Chambre de Commerce et d'Industrie de Sfax and the Université de Sfax; one from Spain, the Escola Europea de Short Sea Shipping; one from Lebanon, the Chamber of Commerce, Industry and Agriculture of Beirut & Mount Lebanon. So, the partnership structure is well balanced, formed both by research and academic centers and by subjects related to business and enterprises world.

In fact, **TECHLOG** aims to strengthen research-industry links in the Mediterranean transport sector by establishing a permanent cross-border EU-Med space where research organizations and transport industries co-create, test and share new technological initiatives based on advanced

driving simulation technologies. The objective of the project is to improve the operational and performance standards of logistics operators, particularly crane operators and truck drivers, operating within the involved countries, in order to raise their quality level and thus improve the logistic competitiveness of the entire Mediterranean area.

In order to foster exchanges and cooperation between different subjects, the project envisages the creation of a cross-border Med Open Lab, the aim of which is to facilitate the sharing of knowledge and joint technological initiatives between the academic world and the industry of transport, using advanced simulation processes to improve the training and specialization of operators and therefore the level of competence of transport and logistics operators. This will help trigger knowledge-based development, based on innovation and advanced simulation technologies, which will contribute to the growth of the EU-Med transport economy.

Specifically, two permanent and integrated Living Labs will be set up, one for the West area (Tunisia Italy and Spagna), the other for the East area (Lebanon and Egypt), which will cooperate closely and cohesively with each other. Living Labs are physical-virtual spaces where companies and the researchers' centers will meet and exchange contents, activities, needs, experimental points of view. This can be done on site (where there is geographical proximity), but also through virtual online systems in order to maximize the potential that the system offers, pursuing a real integration within the Mediterranean area.

Among the main beneficiaries of the project there are transport institutions, port authorities, terminal operators, research centers in the field of advanced simulation, transporters, and dockworkers. Concretely, **TECHLOG** will encourage joint technological initiatives for the Mediterranean transport community in order to achieve common and high-quality standards for transport and port specialized staff. These initiatives will be tested through pilot actions, involving real port and transport operators, both using simulators and developing on site activities.

TECHLOG also focuses on building institutions' capacity to manage innovation processes and formulate joint strategies in the field of advanced and certified training for transport staff to strengthen the operational efficiency of the Med Transport and port sectors. In so doing, **TECHLOG** supports public officers in the challenge of designing coherent and common policies in the field of certified advanced training for transport staff.

Thanks to **TECHLOG**, transport operators and institutions will be provided with a reference point to co-design and deliver technology transfer in real-life environment to improve transport performance and competitiveness. Among the main beneficiaries of the project there are transport institutions, port authorities, terminal operators, research centers in the field of advanced simulation, transporters, and dockworkers.

When the project ends, the Mediterranean area will have high training standards for its logistics operators as well as a technological platform based on Living Lab processes, to improve the skills of all port and logistics operators through which in order to increase the competitiveness of the whole Mediterranean Sea.

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Biography

Dr. Fancello is an Associate Professor at DICAAR – Department of Civil Engineering Environment and Architecture at University of Cagliari; his courses are "Transport Freight and Supply Chain", "Transport Systems Design".

He is General director of CIREM, Center of Transport and Economics Research of University of Cagliari and Sassari; he has been general Manager of Centralabs, Centre of Excellence in Transport of Sardinia, a consortium of companies with Universities of Cagliari and Sassari and several public and private companies in the transport area.

Since 1992 he has been carrying on research activities about interaction between land use and transport, human factors related to active and passive transport safety, maritime transport, freight and supply chain. He is the scientific coordinator and technical director of several national and international research projects. He is the author of 5 books and about 90 papers. He has worked with several public administrations and some private companies for developing projects and plans in the field of transport, traffic and mobility.