



DMS LOGISTICS - The container logistics dispatcher

PhD student in Combinatorial Optimization

Titre de la thèse / Thesis title:



L'IA pour l'optimisation des flux logistiques dans les zones enclavées.



AI for optimizing logistics flows in landlocked areas.

Company: DMS Logistics - <https://dms-logistics.io/> (Marseille).

Laboratory: Ecole des Mines de Saint-Etienne - Department of Manufacturing Sciences & Logistics, UMR CNRS LIMOS 6158, Campus Georges Charpak Provence, Gardanne (Bouches-du-Rhône).

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1/ Background

PROBLEM: Today, **container logistics remains a major challenge** in emerging countries (Africa, Latin America). The actors of the sector in these countries still manage a lot of their operations manually, suffer from a lack of communication between the different stakeholders and the supply chains are impacted, and delayed.

IMPACT: This opacity in operations has a strong impact on traffic (late deliveries, long waits at terminals, congested ports...), which **slows down the development of these ecosystems** and may discourage new entrants from investing in these areas.

« **The good connection of ports with their hinterland is one of the key factors for growth and the opening up of territories in Africa.** »

Patrick Claes, CEO of Vecturis, a railway company in Africa,
THE PORT SECTOR IN AFRICA : FULL COURSE FOR DEVELOPMENT, 2019



SOLUTION: Achieving a [global vision of logistics in an area](#) is therefore a major challenge for its development. Also, today, even if maritime players invest heavily in their communication tools, [the land-based part of containers remains rather opaque](#), often subcontracted to many small local players who are not equipped to communicate effectively about their operations.

IMPLEMENTATION: The challenge is therefore to succeed in bringing together all these container players on land, with the aim of obtaining all the information necessary for the proper conduct of operations. In this way, it will be possible [to anticipate the various container flows and guide all the parties in a supply chain](#) in the conduct of their operations and the defense of their interests.

2/ Objectives

This thesis is part of the development of an IT solution that aims to provide the actors of container logistics (ship owners, ports, carriers, forwarders, states...) with [a tool for decision-making support and visibility on the land operations of their containers and therefore for the fluidity of their activity](#). This study focuses on land-based logistics and should make it possible to anticipate all container movements on land (transport, storage, handling, maintenance).

More specifically, the aim is to understand the mechanisms at the origin of slowdowns in container exchanges, and to be able [to formulate prediction and optimization algorithms](#).

This research and development project therefore aims to model container flows over areas, and represent them as:

- **dynamic** maps (past / present real time / future),
- **real-time** statistical dashboards,
- **recommendations** on the best actions to take (Business Intelligence),
- **real-time notifications** to stakeholders (on their mobile terminal).

The decision-support tools developed by the PhD student aim at:

- **Processing** of vehicle positions and road congestion on graphs,
- **Forecasting** container operations,
- **Calculating** of the best routes (shorter, cheaper, less harder for the truck).

Data of different nature will be used:

- **Cold:** road travel times, container yard surfaces, rolling stock capacity...
- **Warm:** ship manifests, number / availability of resources (human and material)....
- **Hot:** operations and movements on containers, weather, piracy information, road accidents, traffic congestion at a gatehouse or crossing point ...

3/ Required profile

Applicants must have a master's degree (or equivalent) in [computer science](#), [applied mathematics](#) or related disciplines. Candidates must demonstrate good [programming](#) skills and a thorough knowledge of [combinatorial optimization](#). Knowledge of [data science](#) is encouraged.

Knowledge of [port logistics](#), [container transport](#) and, above all, a very strong interest in the related experimental methods and [data processing](#) are of importance for the successful completion of this subject. The candidate must be self-reliant and show a strong sense of initiative. A good knowledge of French and English is essential.

4/ Application

Please send your application by email (in a single file) including a detailed CV, transcripts and letters of recommendation (if applicable) to [Nabil ABSI \(absi@emse.fr\)](mailto:absi@emse.fr). For further information, please contact [Nabil Absi](#), [Dominique Feillet](#) or [Olivier Raveau](#).

