

Digitalization in Freight Transport Services: Balkan Area

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Abstract. New information technologies and international digitalization trends have led to the shifting of the norm in recent freight transport systems. Electronic marketplaces and digital freight transport platforms have emerged since the early 2000s' as a result of the advances in information technology, plus B2B and B2C hubs have developed new tools to facilitate product and information exchange and support the negotiation, contracting, and settlement processes. In particular, freight logistics platforms have been largely investigated and operated by numerous members of the global freight industry, especially in North America, Australia, and Europe, focusing on load and truck booking/auctioning, load matching algorithms, and freight planning services. This paper proposes a categorization and analysis scheme which (i) presents the latest state of practice in freight transport platforms at a global level and (ii) focuses on their offered services in an attempt to categorize these platforms based on the applied services. In addition, the freight exchange platforms adopted in the Balkan region are analyzed following the proposed scheme. As such, a mapping process is achieved and critical issues are identified to be considered in developing a transnational freight logistics platform for the Balkan area.

Keywords: Transport digitalization, Freight logistics services, State of practice in freight transport platforms, groupage.

1 Introduction

Freight transport is a major global market estimated to reach 17.45 billion USD by 2023 [1], which could be increased by modern technology, e.g. the Internet of Things (IoT) and digitalization solutions. Electronic marketplaces and digital freight transport platforms have emerged since the early 2000s as a result of the advances in information technology, plus Business to Business (B2B) and Business to Customer (B2C) hubs have developed new tools to facilitate product and information exchange and support the negotiation, contracting, and settlement processes. These tools could focus on optimizing cost efficiency, enhancing a sustainable mobility environment in EU and delivering Cooperative Intelligent Freight Transport Systems (C-ITS) [2].

Specific emphasis on this applied research paper has been given to the road freight transport sector that involves two main stakeholder groups (user profiles); the industries interested to transfer cargo or utilities (referred as clients or auctioneers) and the providers of carriage services towards the clients/auctioneers (referred as carriers). Customized digital tools have been developed based on the needs of both categories of users.

In particular, freight logistics platforms have been largely investigated and operated by numerous members of the global freight industry, especially in North America, Australia, and Europe, focusing on load and truck booking/auctioning, load matching algorithms, and freight planning services. Although, in this applied research study an emphasis has been given to specific countries of the Balkan region (Albania, Bulgaria and Greece) due to their high share of road freight transport activity (more than 60% of national modal split for freight transport), their recent national strategic key challenges and potential cooperative freight transport activities [2][3].

Specifically, in Albania and Bulgaria a targeted national strategy has been set to address two significant issues: (i) enhancing private-public partnerships in transport sectors to increase multi-national activities in the freight logistics sector and (ii) modernize current C-ITS national infrastructure by promoting the establishment of new tools to reduce logistics costs in both national and transnational levels [2][3]. These issues affect their low achievement in the Logistics Performance Index (LPI) score (2.6 for Albania and 3.0 for Bulgaria with a maximum of 5.0) comparing to the average EU level. Greece has different key challenge areas focusing on rail freight transport infrastructure however this is the main reason for Greece's underachieving performance in the EU logistics sector (3.2 LPI score comparing to EU average level of 3.6 LPI score) [2][4][5]. Thus, there is a high necessity to upgrade existing tracking/tracing tools and customs policy with new digital applications. As such, the aforementioned countries need innovative mitigation measures in order to assure a competitive freight transport market comparing to the standards of average EU level freight transport markets. Taking this into consideration, these countries are further investigated in terms of their potential increase in their freight transport activities.

This paper proposes a categorization and analysis scheme which (i) presents the latest state of practice in freight transport platforms at a global level and (ii) focuses on their offered services in an attempt to categorize these platforms based on the applied services. In addition, the freight exchange platforms adopted in the Balkan region (specifically in Greece, Bulgaria, and Albania) are analyzed following the proposed scheme. As such, a mapping process is achieved, and critical issues are identified to be considered in developing a transnational freight logistics platform for the Balkan area. The remainder of the paper is organized as follows: Section 2 presents a summary of the existing freight exchange platforms for both categories of users at global and EU level. These platforms are categorized according to the type of services they offer (i.e. freight management tools, information repositories or booking/auctioning platforms) and described in Section 3. Following, section 4 presents the digital freight transport services in the Balkan area and Section 5 the respective results are summarized. Finally, in Section 4 conclusions are drawn and pointers for future research are provided.

2 Freight Exchange Platforms at Global and EU Level

Freight transport industries have started to digitalize their services between the early 2000s with the rational initialization of web-based software applications in executional activities of key industry players. Especially in North America (USA & Canada), supply chain companies became early adopters of online freight exchange initiatives making this a common procedure. Nowadays, freight exchange platforms give access to user profiles through multiple platforms (desktop, smartphones, and tablets) with special emphasis on the development of mobile smartphone applications. More specifically, a global state-of-practice market research analysis has been made during this applied research study in order to identify the strong global markets in freight transportation and cluster these applications in a group of proposed categories according to their offered services. This analysis gives an overview of the freight exchange platforms allocation on key markets (continent and country location) along with the category of the services provided. At this point, an important disclaimer should be referred. All the platforms recorded in the following analysis have an English display interface of their services. Thus there is a high chance that relevant freight exchange platforms offered in common languages, such as Spanish, Chinese, French, or others, may not be included in this analysis.

Overall, the majority of the freight exchange platforms examined are from the European Union (EU) region and the Northern American countries (USA & Canada). As can be seen in **Fig. 1**, in total **65 freight exchange platforms** that are offered in English have been identified. The Asian platforms offered in English were based in India and offered transnational freight transport services. Focusing on the European area, it can be observed that the key players on the freight transport digital industry are United Kingdom (UK) and Germany (see **Fig. 2**), which offer their services in a pan-European level as their location is vital for the current Trans-European Transport Network (TEN-T) main network.

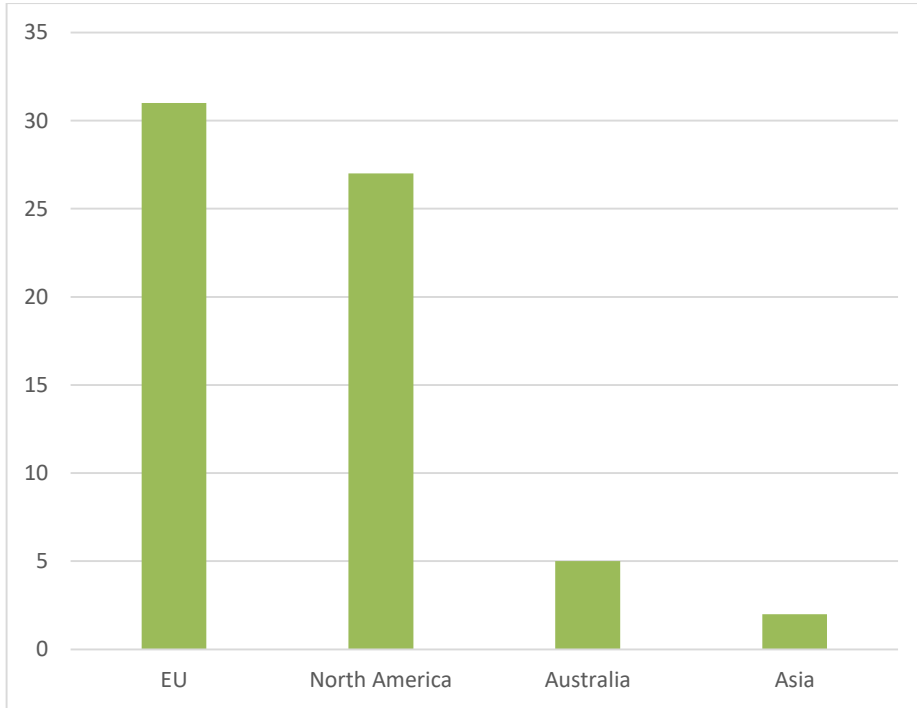


Fig. 1. Freight exchange platforms distribution across continents.

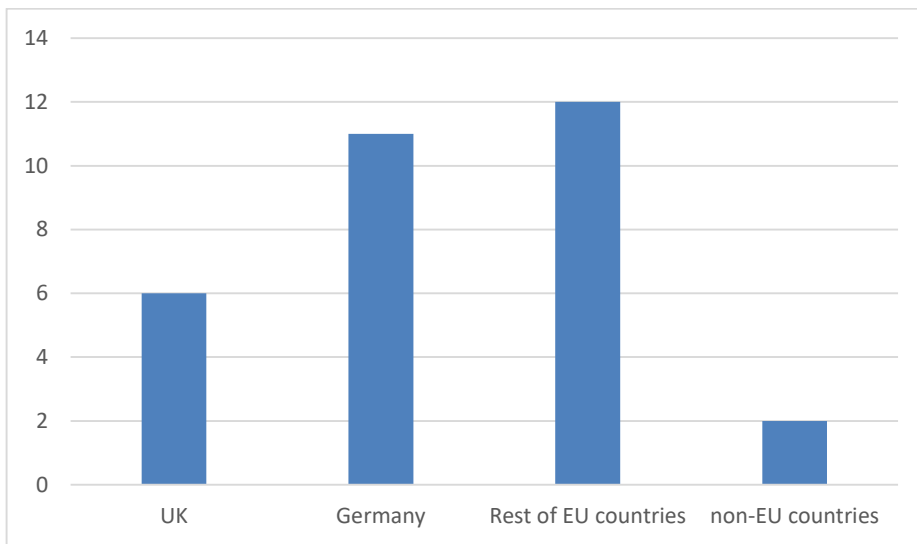


Fig. 2. Freight exchange platforms distribution across EU region.

In the same context, all freight exchange platforms recorded in this study have been grouped into a set of categories. The proposed categories have been created according to the type of provided services. These groups will be presented in the following section.

3 Categorization of Freight Exchange Platforms

During the continuous development of the global freight transport markets, all key market players have invested in the creation of unique services and digital products. In this context, a significant amount of relevant digital tools has been created with slight alterations. Thus, it is important to classify these products according to the type of individual and combinatorial services provided. During this research study, a high-level categorization of the recorded freight exchange platforms (65 in total) has been made. The outcomes could offer indications on the key industry players' requirements and potential clients' goals on EU and Balkan level later on.

The proposed categories with a short description are:

1. **Informative repositories (forums/channels):** The platform operates as a message/post exchange online portal between the two users profiles (clients and carriers). Through such a portal, both user profiles publish their requests, questions, and any other relevant information they want to share with the other users.
2. **Freight planning services:** The platform contains a variety of freight management services, e.g. truck route planning, cargo space management, cargo/truck tracking, etc. The platform operates as a host of the different platforms that are offered to the users in different packages and prices.
3. **Cargo/truck booking platform:** The platform operates in the same context as the first category but, additionally, it offers the option of booking a truck (for clients) or cargo types (for carriers). The booking process is handled via the platform owner and the respective partners via the platform itself or on an external source.
4. **Auction platform:** The platform operates in the same way as in category 3 but with an important difference. Auctions replace booking reservations between the users. The platform follows the same auctioning regulations and procedures as in the other sectors that use auctioning platforms. In this case, all transactions and reservations are confidential, and the deals are coordinated by the platform owner.
5. **Advanced freight services:** This category is a combination of categories 2 and 3 or categories 2 and 4. In short, freight exchange platforms that fit into this group, offer advanced freight reservation and management services that could offer different privileges to their users/members.

The aforementioned categories have been used as clusters in order to groupage effectively the acquired data (see **Fig. 3**). In the last decade, smartphones became a vital asset for every human, and their use is increasing rapidly against other devices such as computers or tablets. Although one of the freight exchange platforms' users group are truck/van drivers (carriers), the evolution of these freight transport platforms has limited smartphone applications (see **Fig. 4**).

As it can be observed, only ¼ of platforms have mobile apps. Moreover, the majority of the freight exchange platforms have been assigned in the first three categories with an evenly distribution between the category groups. In more detail, 32% of the current web-based platforms offer just information for the user groups and 38% of the platforms offer either freight management services or booking reservation products.

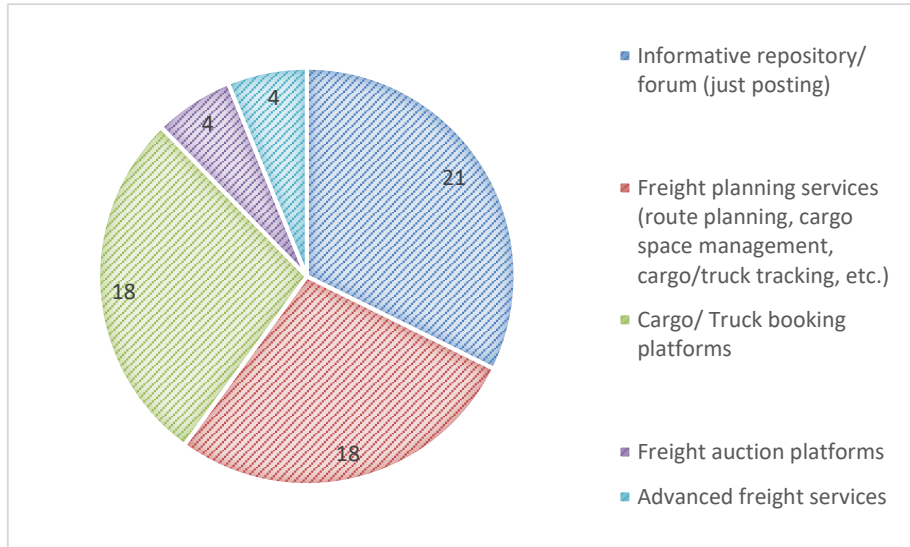


Fig. 3. Results of freight exchange platforms categorization.

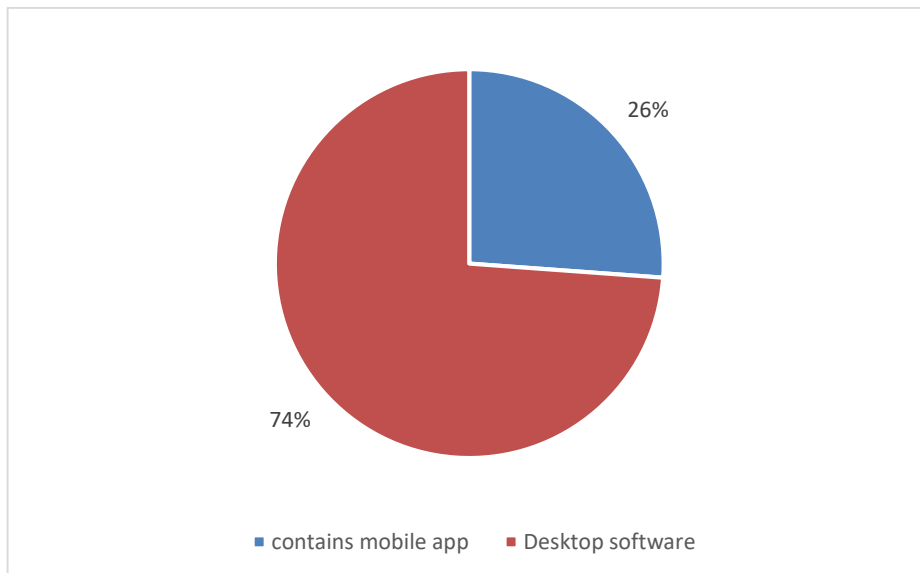


Fig. 4. Freight exchange platforms that include mobile apps.

4 Digital Freight Transport Services in Balkan Area

In this chapter, following an overview of the pertinent literature presenting a summary of the existing freight market systems at the global level presented in the previous section, a focus on the respective freight exchange platforms adopted in the Balkan region will be presented. More specifically, the investigated freight exchange platforms cover three Balkan countries: Greece, Bulgaria, and Albania. These countries were investigated in this study due to the availability of industry stakeholders' input from these countries. The input from forwarders (carriers) and transport companies was gathered during interview sessions held by their representative chambers of each country (i.e. Professionals' Chamber of Thessaloniki, Bulgarian Chamber of Commerce and Industry, Chamber of Commerce and Industry).

Regarding forwarders and transport companies in each country, the transport industry mainly uses traditional ways for freight transport services, although recently, the majority of users started to use digital freight transport platforms or they are willing to become early adopters of newly launched platforms for a small portion of their logistics activities. The most significant example in this research study was the case of Albania.

Currently, carriers and clients in Albania prefer two main online platforms (i.e. "TRANSMOGUL" and "URSUSforwarding") mostly for their online information/communication tool and use their booking options for international cargo shipping. The majority of transactions and arrangements are handled with conventional methods (via corporate networking, phone deals, etc.) according to the stakeholders. On the contrary, Bulgarian and Greek freight transport user groups have pursued towards an increased usage of trustworthy pan-European and national freight transport service initiatives with slight differentiations.

Bulgarian freight industry players have exploited major pan-European freight exchange platforms that are based outside of Bulgaria. These platforms (i.e. "Speditor.NET", "Trans.eu" and "TIMOCOM") offer different freight transportation services along with cargo/truck booking services, which are used for both national and international cargo shipments.

In the same context, Greek freight transport industry stakeholders use platforms with worldwide applications (i.e. TIMOCOM) and platforms produced by Greek entrepreneurs (i.e. "Nestcargo", "Freights", etc.). As the forwarders and clients in Greece can be considered as early adopters (based on the interview outcomes) like the respective Albanian partners, they are eager to approach newly established freight exchange services provided by young entrepreneurs and adjust their operational tasks according to the current digital trends.

In depth, the aforementioned freight exchange platforms have been highlighted by the interviewed key industry stakeholders as the most commonly used tools in their respective countries. Specifically, these platforms are briefly described below:

- "*TRANSMOGUL*" platform: The "TRANSMOGUL" platform [6] is a new initiative that has been recently initialized (within 2019) in Albania to provide simple and efficient communication between forwarders and transport companies. It aims to ensure full capacity usage of transport providers and enhance the efficiency of payment

procedures. It is offered both as an online platform and as a mobile application for easy access.

- *“URSUSforwarding” platform*: The “URSUSforwarding” platform [7] is also used in the Albanian area mainly for international services and by large freight forwarder companies. It acts as a mediator company for transport providers and has access to more than 150 cargo transport units. URSUSforwarding offers economical and custom-tailored transport solutions that enhance flexibility and high quality of service for shippers.
- *“Speditor.NET” platform*: The “Speditor.NET” platform [8] has been developed in Bulgaria and is a separate operation platform. It provides a large number of services both at the state level, national level, and throughout EU. Speditor.NET is the most popular platform amongst Bulgarian freight forwarders and transport operators [8].
- *“Trans.eu” road transport platform*: The Trans.eu platform [9] is a transport exchange platform with modern tools facilitating transport management. Over 6,000 shippers offer cargo, 25,000 carriers create community, and 9000 freight forwarders actively use the platform. The platform is relatively new, but it quickly gains users among the Bulgarian transport and forwarding companies.
- *“TIMOCOM” platform*: The TIMOCOM platform [10] was developed by Jens Thierman in Germany, and it has high activity in Bulgaria and Greece. As a freight forwarder, he was searching for a pan-European procurement platform for transport jobs, but he could not find what he was looking for; so he decided to build it himself. The result was the TIMOCOM Soft- und Hardware GmbH. The company began developing its own freight and vehicle exchange. TIMOCOM GmbH is a mid-sized Information Technology (IT) and data specialist, with more than 500 employees from over 30 countries, and representative offices in Poland, the Czech Republic, and Hungary. As the provider of Europe’s first Smart Logistics System, they are expanding the logistics industry using smart, safe, and simple solutions to meet the daily challenges faced by their customers, who represent a neutral network of over 43,000 verified companies.
- *“Nestcargo” platform*: The Nestcargo platform [11] was founded in September 2013 by Truckbird Private Company as a cargo marketplace that brings in touch shippers with carriers. Truckbird PC’s vision is to create a pan-European cargo marketplace that reduces “empty routes” in road, sea, and air transport and also contributes towards the elimination of transport’s carbon footprint. Therefore, it developed a business tool (Nestcargo platform) that creates value for the international transport industry, while aiming to create new jobs. With Nestcargo, companies can find trustworthy transport shipping companies to ship their goods. Whether it is road, sea, or air cargo transport, Nestcargo’s global network of carriers may help every company to find the right carrier at the right price to transfer their goods.
- *“Freights” platform*: The “Freights” exchange platform [12] was established by Freights SA (a Thessaloniki based startup focusing on freight loads and trucks exchange) and is engaged in electronic management for transportation and inter-transport services, offering immediate, innovative solutions in all kind of business

needs. Freightis is developed to be an innovative freight exchange platform that combines freight forwarders with transporters to accomplish reliable freight and truck exchanges.

5 Results

In this applied research study, an extensive review on the recent freight exchange platforms has been made in a global level, in the EU area and more specifically, in three countries of the Balkan region (Albania, Bulgaria, and Greece). Overall, sixty-five (**65**) **freight transport platforms were identified** in the global level and **seven (7)** of them **are further exploited in the participating countries**. As can be observed, Albanian and Greek freight industry players have a preference for national initiatives rather than the respective global ones. Additionally, only Albanian freight partners focused their digital freight exchange actions in the national level rather than the other two participating countries, which use freight exchange platforms for national and transnational purposes. Based on these outcomes, the potential issues of the limited use of freight exchange platforms in the Balkan area have been recorded during the interview process and are presented below.

In total, carriers and clients have pointed out that they are eager to use freight exchange platforms on a daily basis for national and transnational routes. However, both freight user groups mentioned that in order for these initiatives to be successful, they have to be implemented from both user groups and relevant national authorities due to the legal aspects of cargo shipping procedures. *Ceteris paribus*, carriers have indicated several internal and external barriers that discourage them on exploiting digital freight transport initiatives such as: limited hardware and software infrastructure for the carrier drivers; the fact that the majority of carrier drivers are mature (40+ years old), thus they need specific training programs to learn how to use properly these digital tools; and that the majority of these digital freight exchange tools are not available in mobile devices with a user-friendly interface. Therefore, these issues have to be tackled during future freight exchange platforms development.

6 Conclusions

To sum up, an extensive review on the recent freight exchange platforms has been conducted in a global level, in the EU area and more specifically, in three countries of the Balkan region (Albania, Bulgaria, and Greece). The information has been acquired from interviews with the representative Chambers of the key freight transport stakeholders. The first step of the proposed scheme includes the identification of successful freight transport platforms of a global level and then, the most promising of them are further exploited in the participating countries and they were categorized into five (5) main groups according to their offered services and digital tools (such as service plurality, operability in mobile devices etc.).

This mapping sets the basis for the interviews from key national freight transport stakeholders in order to identify critical issues that should be considered for the creation

of a new innovative freight exchange platform with a strategically targeted holistic approach which aims to enhance the sustainability of users by minimizing transportation costs and groupage (Less than Container Loads).

Last but not least, the proposed approach could be used to investigate and categorize the relevant freight transport initiatives for the rest of the Balkan area (i.e. Serbia, Romania, North Macedonia, etc.) and a comparative analysis among all Balkan region countries could be achieved in an attempt to better identify additional obstacles that discourage freight transport stakeholders to further adopt digital tools and services to their operational work.

7 Acknowledgements

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