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IMPROVING FREIGHT EXCHANGE BUSINESS MODELS – CONSIDERATIONS AND RECOMMENDATIONS

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Abstract

The article delves into the economic and business considerations of implementing freight exchange platforms. It emphasises the importance of developing such platforms to accomplish the European Transport Policy Goals, foster eco-friendly transport, and create a sustainable freight transport industry. To assess the viability of current platforms, it is essential to establish suitable institutional, financial, and business structures. To establish a successful transport business, it is crucial to identify all potential stakeholders affected by the business operations. This includes customers, suppliers, employees, and local communities. Once identified, it is important to analyse the interests and needs of each stakeholder group to incorporate them into the business models. This could involve adapting the business strategy to meet the unique requirements of each stakeholder group or finding ways to align the interests of all stakeholders. The transport business can establish a strong foundation for sustainable growth and long-term success by prioritising stakeholder engagement and incorporating their interests into the business models.

Through retrospective analysis, comparative and content analysis, and generalizations, the study sought to enhance the business models of freight exchange platforms. The article presents an overview of the most used freight exchange platforms in Bulgaria, along with their specific functionalities and applicable business models. These research findings provide reliable evidence for making well-informed decisions regarding the future development of existing and new freight exchange platforms and motivated recommendations for adopting new business models that align with stakeholders' needs.

The article culminates with a comprehensive framework for implementing business models. Upon scrutinising the framework's five key components, appropriate e-commerce models for various freight exchange platform priority areas are structured, and potential enhancements are suggested. The research on viable business models is delineated, and effective methodologies for economic analysis, such as data collection and processing via surveys, interviews, and simulation modelling, are summarized.

Keywords: digitalization in transport, freight exchange platforms, business models, e-marketplace

JEL: R40, R49

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Introduction

The nation's economic progress, coupled with the effects of globalization and integration with Europe, has led to a notable surge in the need for freight transport and shipment volume. As per the country's projections, this trend is expected to persist, encompassing both domestic and international freight transport. To this end, the government must allocate resources to advance new infrastructure and innovative digital platforms that guarantee the safety and high standards of freight transport.

Over the past three decades, our national economy has experienced significant structural changes, making it imperative to examine intelligent services that affect the supply and demand of freight services. Since the deregulation of freight transport in 1990, the expectations of customers from transport operators and freight forwarding companies have transformed dramatically. This shift has resulted in a surge in demand, a gradual decline in transport prices, and a rise in the level of shipment consolidation. As a result, shippers, producers, and retailers have adjusted their production and distribution systems to capitalize on the benefits of lower-cost and higher-quality transport services. To accurately predict the volume of transport and cargo operations executed by transport and forwarding companies, it is vital to comprehend the demand for freight transport services.

The incorporation of freight exchange and auction platforms is a pivotal aspect in enhancing transportation services. These platforms provide business models that dictate the organization of transport operations and the benefits they deliver. They serve as a framework for facilitating connections between exchange operators, transport companies, and their clientele, as well as the associated structures and procedures. Business models are instrumental in transforming commercial prospects into revenue-generating endeavors, with a key emphasis on commercial sustainability. However, sustainable business models for freight exchange platforms should take into account the distinctive attributes and traits that characterize the transport sector.

The successful management of competing interests is a critical function for business models that seek to create commercial value while also generating social and economic benefits for diverse groups of stakeholders. Recent developments in freight exchange platforms have raised concerns about their sustainability and viability, given the high rates of failure experienced by some web-based intermediaries. To optimize platform deployment and performance, operators must design effective business models that balance strategic goals with long-term viability, while also promoting competition and choice among participants.

Digital platforms are proving increasingly important in addressing the disruptions caused by the COVID-19 pandemic, not just in the transport sector but across industries. By leveraging new technologies and web-based platforms,

transport companies can improve their operational efficiency and administrative performance and introduce innovative service offerings that enhance their overall performance. These strategic options not only benefit transport operators but can also support other market players in responding to current conditions and needs in the transport sector (Baron et al., 2017).

This article highlights the crucial role that business models play in ensuring the longevity and prosperity of freight exchange platforms. To achieve this goal, the study tackled two research objectives: first, it examined the current and relevant business models in use for freight exchange platforms in Bulgaria, and second, it provided an overview and analysis of the main authors and research directions pertaining to existing business models for FEPs. The research methods employed in the study included retrospective analysis, comparative and content analysis, and generalisations of stakeholders' preferences for key components and applicable business models for FEPs. The research results offer compelling insights for making evidence-based decisions about the future development of freight exchange platforms at the national level and for providing well-founded recommendations for applying new business models.

A framework for developing business models for freight exchange platforms

In the current demanding environment of the transport sector, auctioning schemes for road freight transport services have piqued the interest of researchers and offer competitive solutions. Numerous studies have explored freight exchange platforms and their applied solving algorithms for improvement opportunities. However, the distribution of orders within these systems presents a complex problem. Approaches relying on "simple independent auctions" that require each carrier to serve only one sender have been deemed insufficient in delivering the synergies that can exist (Bykowsky et al., 2000).

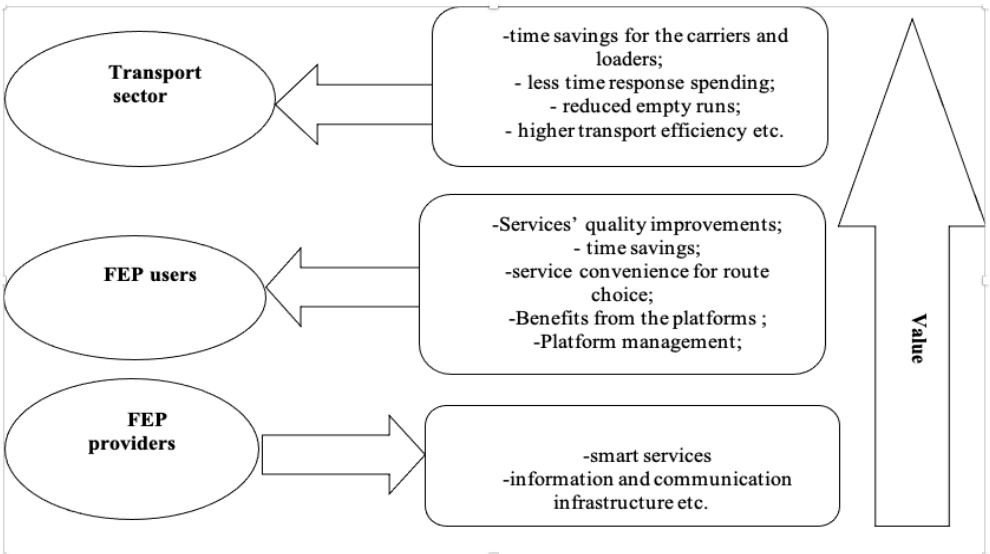
Although most scientific studies have focused on the auctioneers' perspective, there are also case studies oriented towards bidders and carriers. These studies seek to answer important questions, such as how carriers can successfully evaluate packets of applications/orders and what bidding strategy is best for a freight transport company to compete effectively during an auction. Unfortunately, these questions are difficult to answer, and freight transport companies are presumably facing combinatorial optimisation problems. Furthermore, they must reconsider their business models to meet the carriers' (bidders) and clients' demands.

According to Ostenwalder and Pigneur (2002), creating a successful business model requires considering four key factors: Products and services, infrastructure or network of partners, relationships capital, and financial aspects.

Additionally, the credibility of both internal and external stakeholders plays a crucial role in ensuring the long-term viability of any business model, as noted by Giannoutakis and Li (2011). Therefore, to evaluate the sustainability of freight exchange platforms' business models, it is essential to thoroughly examine these fundamental elements.

Product and services

Freight exchange services offer a multitude of benefits to individuals seeking to transport goods. These benefits include simplified procedures and other advantages, which extend to companies that pay for such services, along with added perks. This presents an opportunity for intermediaries, such as forwarders and service providers, to enter the market and capitalize on these benefits. Ultimately, the transport sector benefits from external positive effects, such as cost savings, reduced response times, decreased empty runs, and improved overall transport efficiency.



Source: Adapted and based on the idea of Giannoutakis & Li (2011).

Figure 1: Value proposition for freight exchange platform

The value proposition for a freight exchange platform is that it connects shippers and carriers in a way that enables them to find the most suitable and cost-effective transport solutions. By using a freight exchange platform, shippers can find carriers who have available capacity and are willing to transport their

goods at a lower cost. Carriers, on the other hand, can find shippers who require their services and are willing to pay a fair price for them. This creates a win-win situation for both parties. Additionally, a freight exchange platform can help reduce empty miles and increase efficiency in the transport industry.

Network of partners

The Network of partners, also referred to as the infrastructure, encompasses the key stakeholders who are keen to utilize freight exchange platforms and actively participate in their management. These stakeholders may include transport operators (carriers), transport groups and organizations, individual transport companies, ICT technology companies, forwarders, transport users, payment service providers, and other interested parties. Their shared interest lies in discovering how freight exchange platforms can be leveraged to provide benefits (Kostovs et al., 2011).

Relationship capital

The role of relationships in a platform's revenue and profit is closely tied to its pricing models and the efficient use of tangible and intangible assets. A key factor is the ability to effectively convert suggested services and assets into value. As internet services have gained prominence in recent years, companies have started focusing more on intangible assets like building a strong reputation, establishing supplier networks, safeguarding intellectual property, and providing valuable information. This trend has resulted in decreased investments in tangible assets and greater cost efficiency, enabling more effective resource utilization (Li, 2007).

Financial aspects

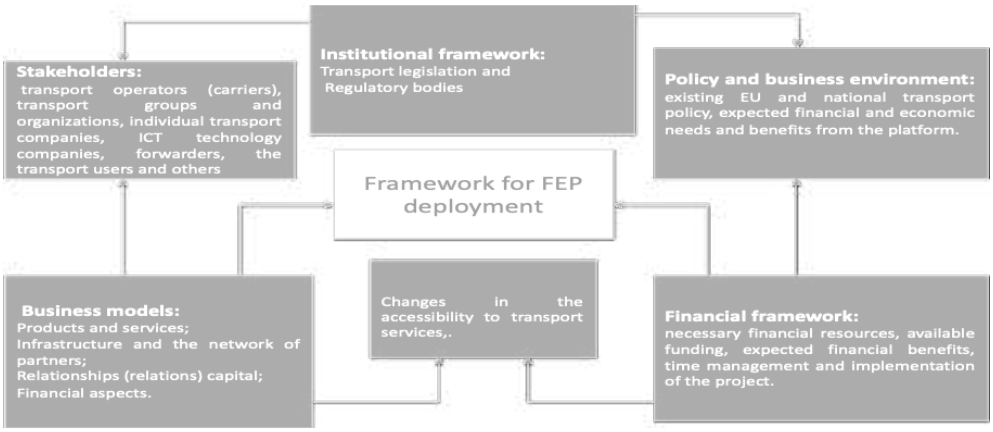
When building and improving the aforementioned three components, it is essential that account is taken of financial considerations. For those running freight exchange platforms, a top priority is devising a viable long-term business strategy. Doing so will enable them to deliver optimal returns and advantages to investors, while also ensuring that contributors are rewarded securely and dependably.

Stakeholders' credibility

The prosperous establishment of freight exchange platforms demands the collaboration of significant stakeholders, with a consideration of financial, economic, and organisational factors. The trustworthiness of stakeholders is

crucial for the advancement of these platforms, especially regarding the equitable distribution of potential benefits across groups and the overall improvement of the transportation industry. To tackle this challenge, it is imperative to establish a suitable framework for deploying freight exchange platforms that incorporate adaptive business models.

Freight exchange platforms connect those who need transport services with those who offer them, streamlining the transaction process (Marasco, 2005). This research delves into the factors that contribute to the success of these platforms amidst fierce competition and industry consolidation. Specifically, the study examines existing business models to identify key features that can promote the long-term sustainability of transport electronic marketplaces (freight exchange platforms). Drawing on a reference framework that outlines various descriptive dimensions of FEP business models (refer to figure 2), the research scrutinizes several samples of operating freight exchange platforms in Bulgaria.



Source: Suggested by the author

Figure 2: A framework for deploying freight exchange platforms

Identified framework of existing freight exchange platforms in Bulgaria

The following paragraph offers a comprehensive evaluation of existing freight exchange platforms. It analyses their competitive standing and delves into their business models, examining their distinctive features and potential for lasting sustainability. This analysis outlines the opportunities for creating a new freight exchange platform that streamlines and effectively manages the logistics processes among carriers, loaders, and freight forwarders. Additionally, it should provide real-time insights into its resources, and as a public marketplace, it must

generate the transactional volumes necessary for long-term viability. Therefore, the business models we compare must be similar.

The major objective of these platforms is to match the demand and supply of transportation services and compile them in a centralised location. As of now, these platforms are operational. By scrutinising the framework for implementing the new freight exchange platform, we can organise the characteristics of various business models that can be customised to adapt to new demands and circumstances. For example:

SPEDITOR.Net platform

When travelling, it is crucial to stay vigilant of potential hazards. The SPEDITOR.Net Platform's homepage updates users on Europe's latest transportation news and events. From new offers to important announcements and engaging discussions, users can find everything they need. Plus, they can conveniently compare fuel prices across various stations and types. Navigate through several sub-menus in the main menu, like Personal Information, 'Who is Here?', Orders, Mail, Settings, Chat, Information by Countries, Exchange, Partners, Discussions, Subscription, Announcements, Companies, Contacts, Guide, FAQ, News, and Exit. The platform provides information on different products, such as advertisements, and offers services like reporting road defects and updating route conditions online. Explore road information for popular destinations, discover ways to avoid toll roads, and easily book parking lots online (SEDITOR.Net, 2023).

SPEDITOR.Net is a comprehensive mobile and web-based application that offers freight exchange services and detailed information about freight carriages and specific requirements. The platform facilitates matchmaking and contracting, though it does not provide real bidding (auctions). It has 13,613 registered users as of 2023. With full automation, users can easily publish loads and place transport orders. The system enables users to search for cargo or trucks based on chosen criteria and place orders efficiently. All users in the system receive simultaneous offers, saving a significant amount of money and time.

The SPEDITOR.Net end-user application provides various services such as cargo and truck entry, message exchange between shippers and carriers, transport offering and agreement concluding. Additionally, the platform offers a list of categorised internet addresses and links, including websites of different transport institutions and organisations, international organisations, news and media, mobile operators, online trade, web portals and browsers, legislation, postal codes, accounting services, software providers, and financial services, among others.

The application has a two-fold purpose. Firstly, to create a framework that can process data from different sources in a common way. Secondly, to develop an end-user application that not only focuses on providing a fully matured solution but also gives developers an overview of the possibilities of the entire framework.

Bulgarian companies' annual registration and subscription fee is 480 BGN, while foreign companies pay 205 EUR.

TIMOCOM platform

The TIMOCOM platform offers access to Europe's largest freight exchange. According to Hänel (2017), freight forwarders and transport operators can select from up to 750,000 international freight and vehicle offers daily. With over 53,000 users, they can find business partners and avoid expensive empty runs (TIMOCOM, 2023). The platform offers services related to two main areas: freight and vehicle space.

The platform provides shippers with new business connections, resulting in increased turnover and fewer empty runs. The platform also enables users to publish and search for special offers, such as courier express package services (CEP), and to use its transport barometer app to find freight and vehicle space while performing transport services. Carriers can minimize their empty runs and unnecessary costs by offering vehicle space and providing information about vehicle type, volume/weight, date, current location, and destination of the vehicle.

Shippers and carriers can create new tenders and arrange e-tenders by choosing between routes and areas. TIMOCOM's freight exchange provides mobile applications for its subscribers to cover their needs on the go. The app has the same menus as those in the web-based platform.

The TIMOCOM platform offers a range of services to users, including quick and efficient access to the spot market. To use the platform, users need to register and obtain a license. The platform is free to use for up to four weeks, after which users are required to pay a monthly subscription fee of 159 EUR. The provider also offers the option of quarterly instalments of 430 EUR per user, which includes up to three registered officers. Users can easily find business partners and streamline their operations with the platform's various functionalities.

Trans. eu platform

The Trans.eu platform is a modern freight exchange platform that helps manage transport services more efficiently. It offers access to over 6,000 shippers, 21,000 carriers, and 12,000 freight forwarders who actively use the platform to connect and collaborate (Trans.EU, 2023).

The platform offers three different products – Trans for Shippers (Cargo ON), Trans for Forwarders, and Trans for Carriers – each with its tools dedicated to the target group's specific needs. It automates road transport management and offers a transport exchange that allows users to publish available loads and vehicles to the Trans.eu community. It also introduces modules that systematise work and provide quick orientation in the current state of all the freights sent by users' offers. Overall, the Trans.eu platform is a comprehensive solution that covers the specifications of the entire transport industry.

The platform provides services for shippers, forwarders, and carriers. In the Shippers module (Cargo ON), shippers can add load offers, publish them on the Exchange, or send them to select operators or forwarders. They can also search for carriers easily and quickly with actual prices. The international community of transport companies allows for faster finding of a carrier.

In the Forwarders module, users can monitor loads and associate the "Trans for Forwarders" menu with any telematics available. The security and evaluation system ensures that only verified companies can access the exchange. A rating system allows users to evaluate their cooperation with other users. Forwarders can specify the price and currency, select carriers, and publish freight. The statuses show what is happening with the offers. Users can find all offers submitted by contractors in one place. Forwarders, as the ordering party, have the option to demand cargo monitoring from their subcontractors. They can monitor the status of their cargo during transit by directly accessing the Monitoring module on the Platform. Additionally, they can leverage the Rating and TransRisk features available on the Platform.

In the Carriers module, carriers can find various load offers depending on the type of load. They can accept, reject, or negotiate the offers. The SmartMatch proposal matches the offer with an algorithm analysing the carrier's company and fleet data. Using the Platform, shippers can ask carriers to provide load monitoring to track the transport route and its status continuously.

The Trans.eu Platform also provides an instant messenger for quick and easy communication to discuss transaction details. To access the platform, registration and subscription are required. The monthly access fee is 109 EUR, while the yearly fee is 981 EUR.

The framework of functionalities and characteristics of the freight exchange platforms mentioned above is presented in Table 1 below. Upon identifying the main features, we will craft a framework and recommend a suitable business model for the new freight exchange platform that aligns with stakeholders' new requirements.

Table 1: The primary dimensions of Bulgaria's most frequently used freight exchange platforms

Name of the platform	Year of establishment	Country of origin	Market focus	Functionalities	Registration and subscription fee	Number of registered costumers	Number of Users	Daily offers
1	2	3	4	5	6	7	8	9
Speditor. NET	2004	Bulgaria	Road freight	Registration. Customized information for users: modal choice. on route selection. information about destinations. warning messages. up-to-date news about road conditions in Europe. number of new offers by type. fuel prices. advertisements etc. Publication of loads. Publication of free transport spaces and trucks. Searching for cargoes by types and destinations. Searching for trucks by types and destinations. Transport offering. Submitting offers for cargo. Agreement concluding. Searching for registered users by profiles. Discussion menu. Exchange messages. Mail.	480 BGN (205 EUR)	11 243	2 895	7763 offers for freight load 1292 offers for transport

Continued

1	2	3	4	5	6	7	8	9
TimoCom	1997	Germany	Road freight	License login software. Shippers' services: freight entry. freight offering by company profile. receiving request quote by carriers. receiving transport offers. Carriers' services: searching for freight by origin and destination. vehicle space offering. registration of available trucks with carrier contact information. searching and offering for available warehouse spaces. Tenders and bids: creating new tenders by routes and areas (using different dimensions as duration of the tender, payment terms, vehicle requirements, routes, transport frequency). receiving information about the current bids. Tracking and tracing of the trucks and loads - maps. Transport monitoring. Companies' profiles and information.	1720 EUR (430 EUR quarterly)	36 000	130 000	750 000

Continued

1	2	3	4	5	6	7	8	9
Trans.eu	2004	Poland	Road freight	Subscription. Trans for Shippers module: publishing and offering loads for transport. SmartMatching. searching for carriers. specifying price offers. negotiating. accepting offers. cargo monitoring. offers archive. list of contractors. publication of automatic rules. rating module with rated transactions. TransRisk module estimating companies' payment credibility. Trans for Forwarders module: receiving loads proposals. negotiating offers with both shippers and carriers. searching for carriers. creating and ordering freights and transport on the exchange. receiving offers from carriers. creating groups of contractors. rating transactions. Trans for Carriers module: searching, accepting, rejecting and negotiating on freight offers.	981 EUR	41 000	41 000	300 000

Continued

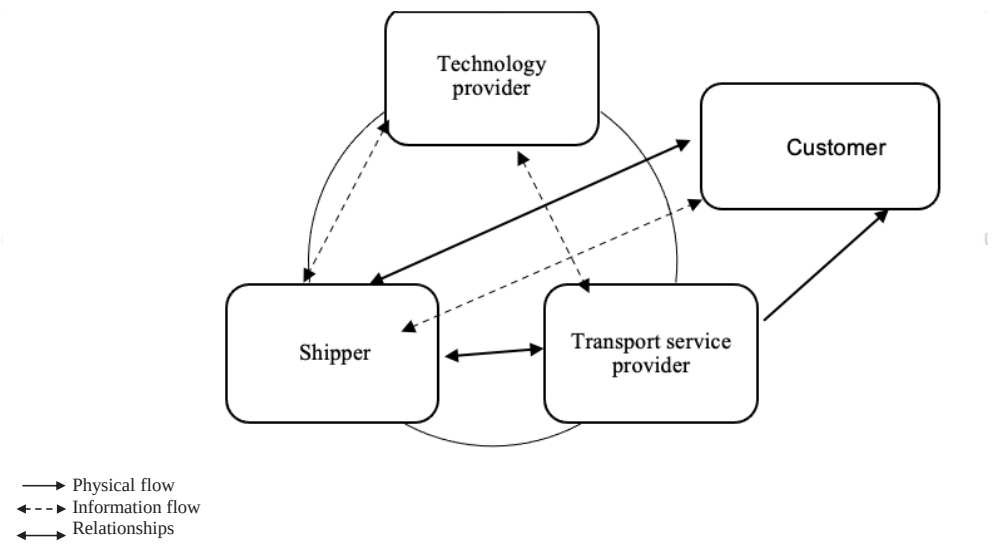
1	2	3	4	5	6	7	8	9
				accepting, rejecting or negotiating offers with a price proposal. sending proposals for transport. sending and receiving SmartMatch proposals. rating transactions. tracking and tracing the transport. adding vehicles' offers by routes and areas. Exchange messages;				

Source: Summarised by the author

Research results

Upon analysing the data, it has been determined that the rise in internet usage has led to new business models, commonly referred to as business-to-business (B2B) or electronic (e) marketplaces. E-marketplaces provide a platform for buyers and sellers to interact and exchange goods or services (Janita & Miranda, 2013). A popular type of e-marketplace is the freight exchange platform, which offers software, tools, and services to connect buyers and suppliers and improve transactions in the freight transport market. These platforms typically involve three parties: the buyer (shipper), the seller (transport service provider or forwarder), and a third-party exchange service provider (e-marketplace provider). In some cases, vendors or buyers may also access the freight exchange platform.

Most existing freight exchange platforms utilise the e-marketplace business model (Figure 3) to facilitate selling assets such as truck space or loads. Customers may post their information on the website, and the platform may or may not charge for its services. However, most freight exchange platforms require a paid subscription. Shippers can browse the posts and advertisements on the website and choose to purchase the transport offered by the first customer.



Source: Suggested by the author

Figure 3: Freight exchange platform business model workflow

In the world of transportation, various types of freight exchange platforms are available. These platforms involve different parties, including transport service providers, customers, financial service providers, and freight forwarders (Rios,

2018). The primary objective of these platforms is to bring together interested parties and provide reliable services to end customers.

Freight exchange platforms can either be publicly accessible (open platforms) or privately accessible (closed platforms), depending on the level of involvement of the interested parties (Nandiraju, 2008). Private platforms are typically used by only shippers and in-house and preferred carriers. In contrast, closed electronic exchange platforms are run by shippers who want to access and select the carriers they prefer to work with (Wang et al., 2007).

On the other hand, public freight exchange platforms provide access to all approved carriers, although some require a certificate for specific groups of carriers. The reliability and attractiveness of these platforms increase with the improved level of security in the identification and authorisation of the participants, such as shippers and carriers (Wang Y. et al., 2011).

Lastly, the freight exchange business model presented in Figure 4 illustrates the relationships between different participants and the movements of the physical flows of goods and services and information flows.

After analysing the e-business models of freight exchange platforms, we have identified the most important factors for their successful implementation. These include providing lower operational costs for both the shippers and the carriers, along with better time management of vehicles and consignments. Additionally, these platforms ensure immediate communication between interested parties, faster negotiation procedures, and agreements. They increase market exposure for carriers and shippers and are especially crucial for small and medium-sized enterprises (SMEs) to attract customers and gain market shares. The platforms also effectively overcome geographical barriers by providing matchmaking for transport operators and potential shippers from different countries and regions. Moreover, the e-business models these platforms use provide access to real-time information about transactions and the fulfilment of freight transport agreements. Finally, it is worth mentioning that the European Road Freight Transport Market has a high demand for direct shipper-carrier engagement (Baron et al., 2017), with no intermediary favouring the application of digital freight exchange platforms.

Despite the advancements of e-commerce and e-business models, there are several drawbacks associated with the use of freight exchange platforms, as noted by Field (Rios, 2018). These include:

1. Lack of participant protection: Many platforms only match shippers and carriers and do not take responsibility for operations and transactions.

2. Security and safety concerns: There are still concerns about data protection, identification and authentication of participants, information sharing, transparency, perceived risk, and disclosure of sensitive data.

3. Quality uncertainties: The platforms promote price-driven competition, but users may not be able to prove the quality of transport services in advance.

4. Lack of transparency: Some users prefer direct person-to-person negotiations, as there are still negative feedback related to the lack of transparency.

5. Reclamation issues: Many cases of low service quality, inappropriate expertise, poor service performance, and inadequate handling of special products are reported.

6. Communication issues: The freight exchange services still suffer from a lack of credibility, and unclear contract agreements are reported with regard to service specifications and freight volumes.

7. Insufficient learning outcome: There is no sufficient learning outcome regarding the bidding and auctioning procedures, as many users couldn't incorporate their experience to improve their future behaviour (Andersson & Norrman, 2008).

Transport service providers (carriers) try to share information gathered and establish mutually beneficial cooperation with other users (Anand, 2005). However, this leads to the replacement of bidders, as the bidder with the lowest cost may not be able to deliver the capacity or service level required by the shipper (Song & Regan, 2003). For this reason, transport operators are often hesitant to join open freight exchange platforms, as they fear the service quality may be lower.

During the local workshop on 02.07.2020 in Sofia, Bulgarian stakeholders provided feedback on the business model and requirements for a future platform. Based on this feedback and the needs of potential users, the following areas need to be considered:

- The future platform should offer opportunities for integration with similar platforms and transport companies from other modes of transport, such as rail, air, inland waterways, and maritime. This will increase the platform's value and provide functionalities for negotiating and implementing combined shipments.
- Stakeholders expressed a need for an integrated online payment system on the platform.
- Potential users and stakeholders desire a higher level of digitalization for transactions on the platform.
- Mandatory registration and identification of users will ensure reliable information, including counterparty verification options such as the date of initial registration, licenses, latest annual turnover reports, etc.
- The platform must ensure high security and protection of user data and information.

- The platform should provide opportunities for tracking user satisfaction ratings for transport companies, freight forwarders, and shippers.
- To achieve the goals of the European Transport Policy, it is important to increase the digitisation of the transport process. One way to do so is by issuing electronic transport agreements, invoices, and bills of lading directly. Both shippers and carriers rely on contracts to establish their relationships and to protect themselves from negative experiences and financial losses. These contracts outline the responsibilities, duties and prices for services and reflect the interrelations between the parties involved. These contractual agreements can establish long-term relationships between customers and suppliers, which can serve as strategic plans for cooperation and interrelations. Such relationships build mutual trust and encourage open exchange of information. However, some users report that they lack familiarity, personal ties, and trust when using freight exchange platforms to find transport partners and suppliers (Skjøtt-Larsen et al., 2003). For some, these platforms provide an opportunity to develop a network of partners, while for others offer a solution to prevent empty runs (Standing et al., 2010).
- The stakeholders have expressed their desire for future platforms to allow transport companies to consolidate their activities and offer and contract transport services and capacities through a single digital office. This would ensure better logistics capability organisation and better control over relationships.
- In the future, platforms could offer better key account management functionality with improved opportunities for reviewing, auditing, and controlling transactions. These platforms could also have better access to external service providers. To achieve this, stakeholders recommend using metrics tools to enhance management and evaluation procedures of services. Metrics tools can also assess the performance and financial stability of external service providers (Boyson et al., 1999; Song & Regan, 2003). Therefore, these Future Electronic Platforms (FEPs) are not just electronic marketplaces for bidding and offering the lowest price. Other intangibles, such as establishing long-term relationships between customers and suppliers, the quality of service provided, and supplier reliability, are also essential in digital contracting (Anand, 2005).

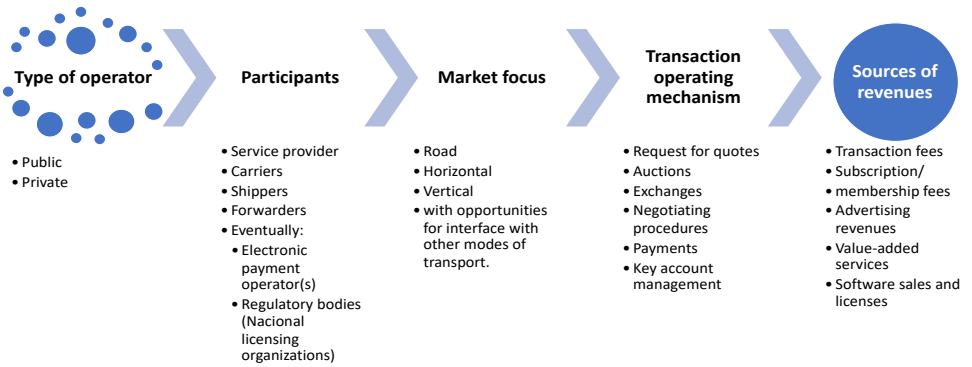
Digital freight exchange platforms currently enable businesses to access and exchange information on road freight segments. However, it is worth noting that the interest of potential stakeholders is growing, indicating a shift towards a wider range of freight segments. In conclusion, digital freight exchange platforms are becoming increasingly relevant and valuable in the transportation industry.

Suggestions and opportunities for implementing novel business models in freight exchange platforms

In analysing the existing business models for freight exchange platforms and their common features, we can identify the following dimensions of FEP business model:

- Type of operator
- Type of participants
- Market focus
- Transaction mechanism
- Source of revenue

By combining these dimensions and considering the preferences of stakeholders, we can determine the main attributes of the business models needed to establish a new freight exchange platform (figure 4).



Source: Suggested by the author

Figure 4: New Freight Exchange Business model dimensions

The first dimension to consider in the type of platform operator is whether it is an autonomous operator, a group of market participants (consortia), or a single service provider Field (Grieger, 2003). Based on the analysis of existing platforms and their business models, it can be concluded that all platforms are operated by independent operators. The main purpose of these platforms is to enable participants to establish and maintain long-term relationships with their partners, as well as initiate new spot relations. This incentivizes potential users to actively participate in transactions, not only for spot allocation of excess capacity and reduction of empty runs or special loads, but also to use freight exchange platforms for operational automation and better integration with customers and

providers, without the need for additional investments in new information and communication solutions Field (Marasco, 2005). To improve existing and deploy new freight exchange platforms, business models should be particularly focused on addressing shippers' needs to shift large volumes of freight from the spot environment to the electronic marketplace, which will increase their viability.

Electronic payment service providers play a crucial role in facilitating the fast and secure transfer of money and other assets between partners. These providers employ advanced technology and encryption methods to ensure the confidentiality and integrity of transactions, while also allowing for quick and seamless payments. At the same time, national regulatory bodies, including national licensing organizations, are responsible for overseeing and regulating electronic payment services. They ensure that all participants are properly identified and authenticated, and that transactions are conducted in a safe and secure manner. This includes enforcing anti-money laundering and anti-fraud measures, as well as monitoring for any suspicious activity. By working together, electronic payment service providers and national regulatory bodies help to create a trusted and reliable system for electronic payments and transactions. This benefits not only businesses and individuals who rely on these services, but also the broader economy.

When developing business-to-business electronic marketplaces, it's crucial to consider the market focus dimension, which involves vertical and/or horizontal market integration (Barrat & Rosdahl, 2002). The latter refers to the industries the marketplace serves. Horizontal marketplaces, like freight exchange platforms, cater to various industries, with many specializing in a single mode of transport, such as road transport. However, stakeholders suggest that these platforms should also offer interfaces with other modes of transport and platforms to facilitate intermodal transport services. This would make it easier to move cargo across different modes of transport, including maritime, rail, inland waterway, and air transport. Horizontal marketplaces offer goods and services to various industries, and freight exchange platforms fall under this category. They provide services to different industries, and most are specialized in a single mode of transport, such as road transport. However, stakeholders recommend that these platforms should also provide interfaces with other modes of transport and platforms to facilitate intermodal transport services. By doing so, it would be easier to move cargo from road to maritime, rail, inland waterway, and air transport.

In the freight exchange business model, the transaction operating mechanisms are crucial. To enhance existing and establish new platforms, it is recommended to implement one or more of the following mechanisms for transactions between carriers and shippers:

- Request for a quote;

- Auctions;
- Exchanges;
- Negotiating procedures;
- Payment processing;
- Key account management.

Based on the analysis of applicable transaction mechanisms presented above, it has been determined that certain existing freight exchange platforms do not provide real auctioning formats. Instead, they rely on negotiations and/or exchange methods to facilitate transactions. While some stakeholders believe that auction formats are the most efficient means to conclude transactions and contract services, others feel that the competitive bidding results can be controversial due to high price pressures that sometimes discourage participants. Therefore, one of the most important issues that needs to be addressed in improving existing and establishing new freight exchange platforms is the adoption of additional transaction mechanisms besides auctioning. This is particularly important in terms of ensuring that FEPs reach a critical mass of users, given carriers' reluctance to participate due to concerns about possible profit limitations because of the bidding field (Goldsby & Eckert, 2003).

Usually, the Freight exchange platform offers a full view across multiple shippers and carriers, allowing participants to find the best partners by using scoring and ranking functions, as well as lane matches. It also includes functionality for key account management, enhancing the long-term attractiveness and loyalty of users. In addition, stakeholders are interested in functionalities that permit instant electronic payments and settlements after the fulfilment of transport transactions. When comparing existing business models, the key stakeholders are interested in full collaboration among participants, which requires a dynamic combination of both vertical collaboration (between shippers and carriers) and horizontal collaboration (between shippers or carriers) (Langley, 2001).

An essential factor determining the success of a freight exchange platform is the revenue sources it provides. The most common revenue sources for existing platforms include:

1. Transaction fees: These are charged as a percentage of the gross amount for every transaction made on the platform. These fees can be charged to carriers, shippers, or both.

2. Subscription or membership fees: Registered users are charged these fees monthly, quarterly, or annually.

3. Advertising revenues: This source of revenue is mainly used in marketplaces that provide additional services such as news, forums, directories, and other content.

4. Fees for value-added services: These fees may include services like credit, payment guarantee, tracking and tracing, insurance, consulting, etc.

5. Revenues from software sales and licenses.

The success and sustainability of both existing and new freight exchange platforms depend largely on the quality of decision-making they provide through their chosen business model and the platform's adaptability to the current business conditions in the transport sector. This evolution involves moving from pure information distribution to smart decision-making, providing a high technological service and ensuring that participants make quality decisions. Finally, another key factor in success is the provision of technological opportunities that allow participants to take commercial responsibility for their offers, thus ensuring a higher level of service quality.

Conclusions

The development of freight exchange platforms relies heavily on their deployment framework, which offers valuable insights into the diverse business models used. While the term "freight exchange platform" encompasses a broad range of elements, each platform and application possess unique characteristics that cater to different groups of stakeholders. This article proposes a framework that could guide the constructing of future business models for new freight exchange platforms.

To thrive in a highly competitive market, existing and new freight exchange platforms must develop appropriate business models that can provide sufficient revenue. Platforms should also expand rapidly and integrate other transport modes while closing any functional gaps to meet stakeholders' requirements and ensure opportunities for providing higher-quality services, including intermodality.

Attracting a critical mass of users in the most important market segments is a significant challenge faced by both existing and new platforms, as it provides economies of scale, like traditional logistics service providers. Additionally, these platforms should provide transparent services that ensure financial stability and existing business models. Platforms must maintain their reputation by attracting large client businesses and providing them with flawless services. Finally, they need to attract experienced and reliable users to expand the market segments they serve and gain access to new clients and smart service offerings.

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