



The Rise of the On-Demand Warehousing: Is the Greek Market Ready for This Change?

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Abstract. The necessity for creating flexible and agile supply chains and adapt on the continuously changing and quite competitive e-commerce logistics market, has made warehousing a strategically critical component of the supply chains. In response to that, new logistics concepts such as on-demand logistics and shared warehousing popped up recently, which with the help of the e-marketplaces offer innovative logistics solutions through a single access point and support the logistics actors to: easily optimize the capacity of their warehouse, avoid the fixed costs of owning a warehouse; implement short-term supply chain planning and finally come closer to the end-customer. Although several on-demand warehousing practices can be seen worldwide, the Greek economic crisis delayed until recently the emergence of such trends so, little is known on how the Greek market would respond to such changes. In response to that, this paper introduces briefly the first on-demand warehousing platform to be operating in Greece and closes the knowledge gap on the Greek market's response following a three-step methodological process: conducting a dedicated questionnaire survey circulated to different types of businesses, arranging logistics expert groups and carrying out extensive desktop research. The paper shows that the Greek stakeholders are quite familiar to shared warehousing solutions and they are open to digital changes such as using an on-demand warehousing platform. However, they are less willing to apply such innovations to their daily business. Therefore, specific platform requirements for increasing the attractiveness of such tools to the Greek market are also highlighted.

Keywords: On-demand logistics · Shared warehousing · Virtual Freight Center · Flexible warehousing · E-Marketplace

1 Introduction

The rapid rise of the e-commerce during the recent years in addition with the highly competitive and constantly changing business environment, have brought significant changes in the way that companies respond to their customers (Kovacs and Kot 2016).

Starting from the USA and spreading worldwide, the need for flexible and agile supply chains, has become a necessity for long-term sustainability (Christopher 2000). Moreover, the excess increase of the e-business and the time sensitive customer requirements, over the last few years, have created the need for implementing “on demand logistics concepts” as well as developing cooperative logistics schemes (shared logistics) (Zhong et al. 2019; Kersten et al. 2018). In terms of warehousing, the growth of the transport sector together with the rapid development of the e-business and the direction towards next day (Amazon), or even within next hours deliveries (Amazon Prime), forced the companies to search for alternative solutions to the traditional warehousing in order to maintain a competitive advantage (DHL 2017). In response to that, one of the latest trends in supply chain management and logistics worldwide, with several start-ups to be noticed popping up in US and in Europe, seems to be the operation of e-marketplaces that provide on demand warehousing services.

In Greece though, the economic crisis and the recession of the past decade delayed the emergence of these trends up until recently. Although over the last few years, the e-commerce is significantly rising (ELTRUN 2017) and the people seem to be more familiar with technological tools for services exchange, little is known about how the market responds to on demand warehousing concepts while no similar e-marketplaces can be found. This paper aims to close this knowledge gap by introducing the development and operation of the first Virtual Freight Center in Greece which aims to facilitate the development of cooperative and on demand warehousing models by the Greek market and gaining clear insight about: 1) the willingness of the Greek market in adopting shared warehousing concepts, 2) the readiness of the Greek stakeholders in using such innovative tools in their daily operations and finally 3) which are the most preferable functionalities of such an e-marketplace and by which criteria the Greek logisticians would choose this tool for their daily operation.

This paper is structured in two main chapters. The first chapter presents initially an extended literature review on the new emerging concepts of shared economy and on-demand logistics, continuing to the introduction of a brand new concept, called “on demand warehousing” and the operation of a Virtual Freight Center in Greece and finalizing to the main research questions that this paper comes to answer. The next session presents the methodological process of the research and the final chapter presents the main findings and results.

2 Conceptual Background and Terminology

2.1 The Benefits of the on Demand and Sharing Economy in the Logistics Market

The term “on demand economy”, also known in literature as “gig economy” and “sharing economy”, was first introduced by technological start-up companies that penetrated the market the past decade. The concept behind this new trend was the provision of innovative solutions for connecting the demand for a service or product with the supply through a single access point and thus satisfying instantly the customers’ demand (Dervojeda et al. 2013, ECORL 2015). The main differentiation from

the “sharing economy” concept lies in the fact that in the sharing economy, the technology enables the cooperation among the companies and individuals by allowing them to share and benefit from the excess capacity of their assets (vehicles, warehouses, houses, parking spaces) (Melo et al. 2019). On this basis, innovative sharing economy start-ups advocate that economic efficiency and growth can be realized through appropriate accelerator programs that steer start-ups towards the adoption of sharing economy concepts that enable the use of underutilized and redundant resources in order to further scale-up (Grinevich et al. 2019; Rockstart 2019). Therefore, the “on-demand economy” attributes involve the responsive fulfillment of demand and of its variances, within predefined time-windows, while the “shared economy” attributes, the sharing of assets, capacity and resources. Finally, the “gig economy” attribute involves the temporal character of the economy, characterized by short-term & independent contracting.

So far, in the logistics sector, the “on demand logistics” services were mostly related to the “instant deliveries” services as one of the main outcomes of the rapid growth of the e-commerce economy. Particularly in EU, the on-demand deliveries are noticed to be one of the fastest growing on demand logistics sectors with an increase of the customer’s participation in 2017 up to 110% and total spending to \$8.2 billion (Rockbridge Associates 2018). Instant deliveries were defined by Dablanc et al. (2017) as the provision of a “two hours window” delivery services, implemented by either a private actor or an independent contractor, following the connection of the demand and the supply through a digital platform (Dablanc et al. 2017). As on-demand deliveries are required to be responsive and fast, some orders are dispatched at very low utilization levels. This leads though to higher trip frequencies, more vehicles, traffic, noise, emissions and eventually costs. To counterbalance these externalities, new opportunities arise for shared logistics operations (Perboli et al. 2016). Among the advantages of sharing economy in logistics and supply chain management are the enabling of the companies to share cost-intensive assets such as warehouses, vehicles and information flows (Ocicka and Wieteska 2017) Logistics companies have started the past years to sharing assets mainly warehouses and transport capacities in order to increase their efficiency, better utilize their excess capacities and quickly respond to the need for on-demand deliveries due to the e-commerce development. For example, the innovative vehicle-sharing platforms that exist worldwide, allow the interested companies to share information about trucks, routes and load factors. The World Economic forum estimated that 15% of the trucking market would be using such kind of platforms and 20% of the warehouse market would move to shared agreements by 2025 (World Economic Forum 2016).

During the last decade, all companies that own or use warehouse facilities, either retailers, manufacturers or 3rd party logistics providers, face difficulties to determine warehousing strategies. Some organizations operate in very demanding environment with extremely seasonal fluctuations in the demand. For that reason, shared warehousing is getting industry attention over the last few years. However, finding and securing warehouse space for periods of excess demand can be a time-consuming, lengthy, and often frustrating process. These were also the main drivers that pushed towards the introduction of the “on demand warehousing” concept. The following session aims to provide clear insight on the main attributes of on demand warehousing and the existing experiences that can be found in the global market.

2.2 The Concept of on Demand Warehousing, Existing Experiences in Europe and in Greece

Warehouse on demand is filling the need for flexible, short-term warehouse space across a fast-paced capacity-crunched supply chain. The on-demand warehouse model helps to transform a traditionally fixed cost into a variable cost that enables greater flexibility in areas of the supply chain through cooperation and sharing capacities. A shared, on demand warehouse can be a flexible solution with short-term contracts (1–3 years) or even daily/weekly/monthly according customers' requirements. The main idea behind shared on demand warehousing comes from the need for connecting in real-time, logistics operators looking for storage space (demand) with existing storage facilities that are partially utilized by other companies (supply). According to a Flexe (2017) report on Warehouse Capacity and Trends, companies that use on-demand warehouse space to meet a single peak seasonal increase in inventory were found to have improved the utilization of the warehouse by approximately 100%. In addition, these companies reported that they were successful in reducing seasonal inventory and warehouse costs by 50%.

In response to the rising need for on-demand warehousing, companies worldwide have developed e-marketplaces which offer services beyond just technology platforms that match demand and supply. The e-marketplace in warehousing connects any company with additional warehouse space, to a company that needs it for a specific amount of time. The using company can utilize its excess capacity for short-term or long-term projects, which results in saving more money and having greater flexibility and convenience (Gartner 2019). The use of on-demand warehousing e-marketplaces can be compared to services like Uber and Airbnb.

In US a company called Flexe finds spare warehouse space for e-commerce merchants all over the US and is fast becoming the Airbnb of warehousing. In five years, Flexe has built a marketplace of spare storage space in 550 warehouses representing close to 2.3 million square metres without purchasing any assets. In addition, several e-market places developed worldwide (Stockbooking, FlowSpace, Stowga, Stord, Ware2Go, a.o.) to deal with dynamic distribution and offer greater proximity to the customers. Some of the on-demand warehouse providers report that there are companies which now placing all their warehousing needs through on-demand platforms. It remains to be seen whether the traditional warehouse providers such as K+N, DHL and XPO will enter the highly competitive on-demand arena as the financial benefits for their customers as well as for their own assets are prevalent (Gartner 2019). The target of all such e-marketplaces is to facilitate the storage needs or the logistics services of their customers, to gain agility and generate overall savings.

Despite the development of such e-marketplaces for on-demand warehousing worldwide, Greek stakeholders have paid little attention so far. It is well-known that there are existing platforms in freight transportation (Timocom, Freights) in Greece, which constantly gain market share however, there are no such solutions for on-demand warehousing so far. In response to that, a research project under the name Warehouse Match & Optimize (WareM&O), co-financed by the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, develops a Virtual Freight Center for connecting in

real-time, users that are in search for warehouse space (demand) with others that have excess or underutilized warehouse space (supply) through a single access point, a digital platform. The VFC aims at providing to a wide range of businesses the required visibility and information on the available logistics facilities and services in various regions of the country together with clever tools to make effective use of these areas and adapting a flexible and dynamic supply chain structure according to their needs and business goals.

For the successful implementation of this tool and the effective penetration after the project's completion in the Greek market, it was necessary to be in frequent communication with the Greek stakeholders and potential users of the platform in order to identify the potential interest for the VFC; the maturity level of the actors to the daily use of matchmaking platforms and finally to capture the main requirements and basic functionalities of the tool for making it attractive to the Greek entrepreneurs. The outcomes of this process constitute the main subject of this paper. In the following chapters the methodological process and the main findings of this research are presented.

3 Methodology

Our research approach was based on three different pillars as described below:

1. The implementation of expert group meeting with stakeholders that operate in the supply chain. The expert group was held in Thessaloniki and gathered at least fifteen field experts from different business sectors.
2. A dedicated questionnaire survey among different company types. The survey comprised of two parts. The first part collected data about warehousing in terms of size, needs, ownership status and load factor. The second part of the survey asked about their opinions regarding the willingness to adopt on-demand warehousing solutions and about the functionalities that such an e-marketplace should have in order to attract them as customers. The dedicated questionnaire shared to the potential users in three different ways. First, it was shared during the expert-group to the participants for completion. Then, it was shared electronically through a google-doc form to a large database of potential interested companies. Finally, the questionnaire distributed to the participants of a dedicated logistics conference, SOLUTIONS VI, in Thessaloniki.
3. A comprehensive mapping and desktop analysis of the Greek market in terms of warehousing. Data analysis for both questionnaires and expert group was made in Python programming language.

4 Findings and Implications

In Greece, the logistics infrastructure is concentrated in three key, discrete and inter-connected centers in Attica, Viotia and Thessaloniki. However, a lack of high standard facilities for the provision of high level logistics services is noticed. More specifically,

there are 243 warehouse and storage companies, deploying 4232 facilities in Central Macedonia and Attica region (Eurostat 2016). In addition, the total number of companies recording in transportation and storage were 62878, having more than 65623 facilities in the same regions. It can be seen from the statistics above, that there are plenty potential customers for an on-demand warehousing e-marketplace at theoretical level. Given the fact that no previous research has been done for the Greek market, our paper aims to reveal the maturity of the Greek market to adopt such tools for the daily business.

The main findings from the expert group have shown that one fundamental attribute for the VFC’s attractiveness is the provision of increased visibility in terms of warehousing availability along the whole Greece. The logistics and warehousing experts share the opinion that there is need to enhance the visibility along their supply chains in conjunction with the development of collaborative models in order to enable Greek businesses to achieve the necessary flexibility and respond rapidly to the constantly-changing challenges of the national and global economy. In addition, the experts admitted that even though there are notable potential advantages from the use of an on-demand warehousing platform, the Greek market is not yet familiar with such innovative tools, thus resulting in difficulties in adopting such solutions for their daily business.

In order to enhance and verify the preliminary results derived from the expert group, we conducted a questionnaire which was shared to all business sectors relevant with logistics and supply chain industry.

4.1 Sample’s Main Characteristics

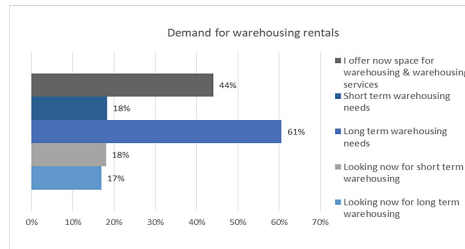


Fig. 1. Demand for warehousing rentals.

The initial sample consisted of 90 Greek logisticians which were occupied in 69 dominant Greek companies, supply chain operators. Based on the above sample, the main findings in this survey; the dominant business sector that was participated is industrial and manufacturing (58%), while 3PL companies (30%) follow and the remaining 12% are retailers, transport operators and supply chain business related companies. In order to understand in-depth the potential demand for the VFC’s services, the respondents were asked to record the number, the size and load factor of warehouses that they operate. The main findings show that only 6% of them do not operate at that moment a warehouse and is in search for the appropriate facility. The remaining 96% is

operating either their owned (36%) or rental warehouse facilities (28%) or both (31%). In total, 140 warehousing facilities were documented, where approximately 65% of them were big facilities with more than 2500 m² capacity (Fig. 1).

The next and final part for understanding in depth the participants' needs and identify the potential gap that this service comes to fill in, is to investigate the current demand for warehousing facilities. Hence, the following figure highlights that almost the 35% of the respondents is at the moment looking for a new facility where half of them search for short term warehousing solutions. In terms of supply, there is a 44% that offers space or/and warehousing services, which shows that besides the 3PL companies, also the remaining business sectors are willing to offer space for shared warehousing.

4.2 Main Findings About the Interest for Shared Warehousing Solutions and the VFC

The main philosophy of the Virtual Freight Center lies in the development of cooperative warehousing solutions for maximizing the load factor and the corresponding revenues of the supply chain companies and the provision of on-demand and flexible warehousing rental services for facilitating the short-term warehousing and satisfying appropriately the customer's demand. In line with this aim, the potential users of the VFC should be 1) interested in using this platform and 2) willing to cooperate and either have excess warehousing capacities for short-term or long-term or they are in search for warehouse space in order to satisfy their demand. Interestingly, both the survey and the expert group showed that regarding the first point, mentioned above, almost the 80% of the respondents are in favor for the operation of such a tool, while a 13% is uncertain (Fig. 2).

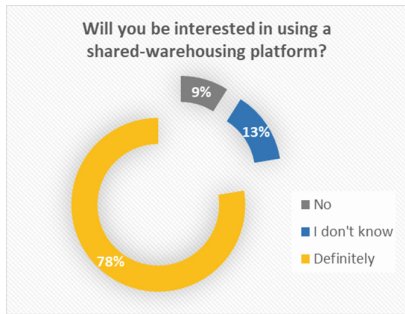


Fig. 2. Interest in using shared warehousing platform.

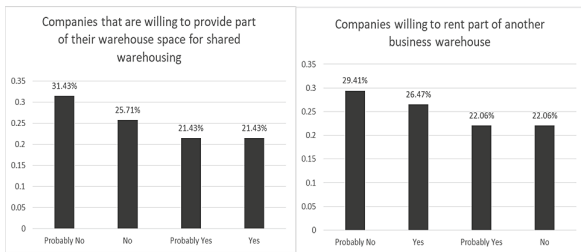


Fig. 3. Willingness of the Greek market to implement shared warehousing solutions.

Now in terms of willingness to cooperate, the main findings observed, reveal a lack of consistency in the respondent's opinion comparing to the strong interest expressed above for the VFC. More specifically, the following figures show that only the approximately 22% and 25% of the respondents are willing to either share part of their

available warehousing facilities for cooperative warehousing or rent part of the warehousing facilities of another company, excluding the 3PL companies. However, a corresponding percentage of 22% respectively is skeptical but positive towards this concept (Fig. 3).

For clarifying the reasons for this lack of readiness in adopting shared warehousing concepts, a deeper analysis on the potential correlations with the sample's characteristics was crucial and showed that vast majority of non-positive answers are highly connected with the load factor of the companies' warehousing facilities. More specifically, the participants who have higher load factors (up to 86%) are more reluctant to adopt shared warehousing solutions, mainly because they don't see any opportunities for further profit, which constitutes a quite logical explanation. On the other hand, the corresponding load factor rate for those who are willing to explore the cooperative is at 79%. Further analysis on the non-positive respondents in the frame of the expert group revealed that also the lack of clear understanding on the main benefits and potential impact of this VFC on a company's logistics operations, is also one of the reasons. In any case, the outcomes are quite encouraging for the Greek market and show a market that although it is not mature enough at the moment, is open to changes for improving the effectiveness of its warehousing and distribution methods.

4.3 Which Are the Main User Requirements and Criterial for Making the VFC Attractive to the Greek Market?

Having identified the positive reaction of Greek market in the existence of a VFC, the next goal was to capture the parameters that will make such a platform attractive and easy to use. Taking that into account, the participants that showed a positive or neutral interest in the operation of the VFC (the correspondent 91% of the total responses), were asked to choose from a list of user requirements the most important based on their current warehousing needs. The 47% of the respondents pointed out that a dynamic and constantly growing database of warehousing repositories would help them to find quickly and easy the available spaces. In addition, the stakeholders would like to have a tool that provides quick and easy finding of the right warehouse space in the appropriate cost (43%). Furthermore, 37% of the respondents would prefer to have a tool that can quickly and easily match the demand and supply of warehouse availabilities or warehouse services. Moreover, 35% of the sample would like to use the platform also as an observatory of prices of services and warehouse locations which will allow them to map and record the current market condition and have a more complete view about the offers.

Finally, in terms of the most crucial criteria for the Greek stakeholders to use this tool, three were the main criteria identified: 1) Ease of use: The daily operation of such a tool should be very as simple as possible, even for users that have no previous warehousing or logistics experience; 2) WMS/ERP connectivity: A very significant criterion is to ensure that the tool will be able to connect with the intercompany systems such as WMS/ERP, and finally 3) Cost of the service: The cost of the service should be affordable for the companies in order to choose this tool as a solution to their warehousing problems.

5 Conclusion and Future Areas of Research

The present paper, introduces to the Greek stakeholders the concept of shared economy on-demand warehousing, and tries to fill the existing knowledge gap on the following: What is the level of maturity of the Greek market in adopting shared and on demand warehousing solutions? Are the Greek stakeholders interested in using a Virtual Freight Center in their daily operations and finally which are the most crucial and preferable functionalities of an on-demand e-marketplace in order to make it attractive to the Greek market.

To accomplish this goal, the close communication with the Greek logisticians through expert groups was necessary as well as the implementation of an extensive data collection through both a dedicated questionnaire handing out to the potential users of the VFC and a desktop research.

The main results of this study can be summarized as follows: Greek stakeholders seem to be very interested in using a shared-warehousing platform, but are less willing to implement such solutions to their daily business. Although the majority of the respondents is not yet determined to use such a platform, almost 45% is an optimistic and positive percentage to begin with showing that Greek market is open to digital changes. The warehouse load factor seems to be inseparable with the stakeholders' willingness to adopt shared warehousing. In addition, issues related to data management, increased supply chain visibility, specific platform requirements and selection criteria were highlighted by the respondents to develop an attractive and easy to use platform.

The results presented in this paper are part of the main research outputs of the project WareM&O which is co-financed by the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation.

Since on demand warehousing is a relatively new concept, there are several opportunities for future areas of research. Some indicative future research questions that could be addressed are: Which are the implications of on-demand warehousing solutions to the urban environment? How can the city respond to minimize the potential negative externalities of the exploitation of all possible real estate, including small areas located in the city center, for on-demand logistics operations?

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