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PARCEL LOCKER APPLICATIONS IN TURKEY

TÜRKİYEDE'Kİ KARGO DOLABI UYGULAMALARI

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Abstract

Alternative delivery applications are gaining popularity today, and parcel lockers are differentiated from others as they offer different delivery location options to customers. One of the biggest problems faced by courier companies today is that customers are not always available at the place of delivery during delivery. This leads to an increase in failed deliveries that place an extra burden on last mile operations, not only in terms of cost, but also in terms of environmental concerns. One of the effective methods to deal with this problem is parcel lockers. Parcel lockers and related concepts are currently used in various countries worldwide, and in some countries, their installation and use are supported by the government. Parcel lockers not only help logistics companies navigate their operations and costs, but also give the customer the power of choice. Therefore, it is considered necessary to investigate the parcel locker applications in Turkey. This paper intends to present the current state of parcel lockers in Turkey, the companies providing the service, their profiles, and their plans to provide beneficial knowledge to academia and industry.

Keywords: Automated Parcel Machines, Delivery Locker, Parcel Locker, Smart Locker

Özet

Alternatif teslimat uygulamaları günümüzde popülerlik kazanmakta ve koli dolapları, müşterilere farklı teslimat yeri seçenekleri sunması nedeniyle diğerlerinden ayrılmaktadır. Günümüzde kargo şirketlerinin karşılaştığı en büyük sorunlardan biri, teslimat saatlerinde müşterilerin teslimat yerinde bulunmamasıdır. Bu durum, yalnızca maliyet açısından değil, aynı zamanda çevresel kaygılar açısından da son mil operasyonlarına ekstra bir yük getiren başarısız teslimatlarda artışa yol açmaktadır. Bu sorunla baş etmenin etkili yöntemlerinden biri de koli dolaplarıdır. Koli dolapları ve ilgili konseptler şu anda dünyanın çeşitli ülkelerinde kullanılmaktadır ve bazı ülkelerde bunların kurulumu ve kullanımı hükümet tarafından desteklenmektedir. Koli dolabı kullanımı, lojistik şirketlerinin operasyonlarını ve maliyetlerini yönlendirmesine yardımcı olmakla kalmaz, aynı zamanda müşteriye seçme gücü de verir. Bu nedenle Türkiye'deki koli dolabı uygulamalarının araştırılması gerekli görülmektedir. Bu makale, Türkiye'deki koli dolaplarının mevcut durumunu, hizmet veren firmaları, profillerini ve planlarını sunarak akademi ve endüstriye faydalı bilgiler sağlamayı amaçlamaktadır.

Anahtar Kelimeler: Otomatik Parsel Dolapları, Teslimat Dolabı, Kargo Dolabı, Akıllı Dolap

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1. INTRODUCTION

1.1. E-commerce and Parcel Lockers

Changing world conditions caused e-commerce, which was expected to grow, to grow even faster with the momentum triggered by Covid 19. In 2020, e-commerce retail sales exceeded $4.2 trillion worldwide, and over two billion people made purchases online (Coppola, 2021). When the e-commerce volumes in Turkey are analyzed, it is seen that the e-commerce volume in the first six months of 2021 increased by 75.6% compared to the first half of 2020, reaching 161 billion TL. In the first 6 months of 2021, the number of orders increased by 94.4% from 850.7 million to 1 billion 654 million. While the ratio of e-commerce to traditional commerce was 17.6% on average in the first half of 2021, the highest rate was observed in May (20.2%) see Figure 1 (T.R. Ministry of Commerce, 2021). An e-commerce report prepared for Turkey and published in November 2021 presented the top 5 online stores holding 55% of the market share in total, and these are given as Trendyol, Hepsiburada, LCW, Çiçek Sepeti, Modanisa, respectively. According to the same report, 41 million people shopped online in 2021, and this number is expected to reach 58 million by 2025 (Eden et al., 2021). This shift from traditional commerce to e-commerce brings its own challenges, such as increased individual orders and delivery numbers.

In light of the statistics, it can be indicated that rising online shopping, parcels, and delivery numbers will further complicate last-mile logistic operations. Customers demand fast, reliable, and low-cost delivery; however, last-mile delivery operations remain the most expensive and incompetent part of the logistics journey for goods (Gevaers et al., 2009). Therefore, it can be said that managing vast number of parcels with minimum cost while ensuring quick delivery and service satisfaction is one of the biggest hurdles of last mile distribution caused by expanding e-commerce volumes (Buzzega & Novellani, 2022).

In addition to cost and speed concerns, another aspect to consider is failed deliveries. Repetitive deliveries due to the customer not being at home during delivery hours place an extra strain on operational efficiency. Given the traffic congestion in urban areas, second or third visits to customer addresses will further delay the delivery time and cause dissatisfaction, in addition to causing extra costs and environmental damage. The parcel locker concept which is seen to be recognized by many logistic firms can be an effective solution to last mile delivery problem.

Parcel lockers can be classified under collection points that are located in public areas that are accessible 24/7, keep the parcels for a certain time, and provide flexibility to the customer to collect delivery in a more suitable time with a given order code (Lagorio & Pinto, 2020). These lockers are generally used for parcels nonetheless can also be used for food and drug dispatches with the right equipment such as climate control devices. Lockers, through its nature of being accessible 24/7, diminish the need of synchronizing delivery time between customer and dispatcher and lessen failed delivery rates (Buzzega & Novellani, 2022).

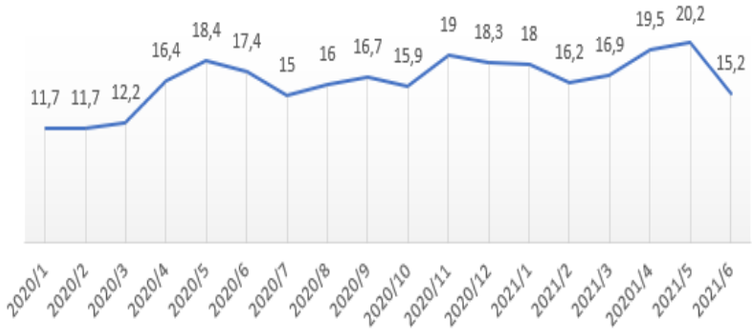

Figure 1: E-commerce to traditional commerce ratios.

1.2. Parcel Lockers Around the World

Currently it is reported that there are 322 parcel shop and locker networks in 69 countries with numbers reaching 1,8 million worldwide (Proud & Chapman, 2021). First parcel locker application (DHL Packstation) was launched in Germany in 2001 by DHL (Behnke, 2019); it is one of the largest locker networks in Europe and has over 8500 locations. DHL plans to expand its network to 12000 in Germany alone by 2023.

Hive Box is China's biggest parcel locker company, founded in 2015, managing up to 170000 parcel locker stations in more than 100 cities and delivering around 9 million parcels everyday (Liu et al., 2021; Morgan, 2021). Hive Box lockers are also supported and promoted by the government and are seen as an active social dinstancing measure against Covid 19 (Morgan, 2021).

Singapore is another country where the use of the parcel locker is supported by the government (Lyu & Teo, 2019). In fact, a nationwide locker delivery network called the Locker Alliance was launced in 2018 with a pilot trial that ended the same year with astonishing results. Since then 4 different locker operators, Blu, Parcel Santa, Pick, and Singapore Post, are providing service around the island under the Locker Alliance with nearly 1400 lockers (Locker Alliance, 2022).

Even though the United States currently have multiple parcel locker operators, parcel lockers were not deployed until 2011. Amazon implemented Amazon Hub Locker service in 2011 and can be seen as a pioneer firm in parcel locker installation, followed by the United States Postal Service (USPS) and UPS (Keeling et al., 2021). Amazon Hub Lockers currently operate in more than 900 cities in strategic locations such as shopping malls, grocery stores, and the like (Fries Holsenbeck, 2018).

Inpost is a Polish company founded in 2006 that manufactures and operates parcel cabinets. It is the first Polish company to establish a locker network in the country (Iwan et al., 2016). Inpost has around 16,000 lockers in Poland alone and provides service, lockers, and even refregirated lockers to 20 different countries around the world including the UK, France, United Arab Emirates to name a few (Iwan et al., 2016; Pruchnicka, 2021).

Australia Post, a government-owned postal service, launched its parcel locker program, 24/7 Parcel Locker in 2012. Initial installation sites were owned by Australia Post, but since then Australia Post has also made some strategic partnerships with chain stores and petrol stations for the locker stations to be installed. There are currently over 1,000 locations in the country, and the network is expanding every year (Lachapelle et al., 2018).

1.3. Methodology

The implementation of the parcel lockers is not a new phenomenon for some countries in the world such as Germany, Poland, and UK. However, it is still in the introduction phase of its life cycle in Turkey. To the best of our knowledge, there is not any paper that investigated the parcel locker applications in Turkey. Therefore, with this study it is aimed to answer two questions:

- What are the benefits, acceptance rates, and location related aspects of the parcel lockers?
- What kind of parcel locker implementations are made in Turkey? Which companies are these, and in which cities is this service being provided?

Secondary data is used to answer these research questions. Secondary data is collected through academic data bases, internet searches, scientific papers, reports and also, logistics provider websites are extensively searched.

2. LITERATURE REVIEW

2.1. Benefits

Parcel lockers offer so many benefits as a solution to last mile delivery problems. It has its advantages to the cities, carriers, and consumers such as regulating traffic jams, reducing flow and failed deliveries, and increasing consolidation and savings (Deutsch & Golany, 2018). Other positive aspects are to reduce the total distance traveled for the customer and the carrier (Song et al., 2009; Song et al., 2012), thus reducing both energy consumption and carbon emissions in line with sustainability needs. Parcel locker practice will be unavoidable in the future and needs to be integrated to the logistics network and can be used to increase profit. Parcel lockers are being addressed as a solution to decrease the energy consumption and utilizing different sized lockers can have an impact on decreasing cost and energy consumption even more (Ji et al., 2019). Compared to stationery locker units, movable locker units require smaller fleet size to cope with the volume (Schwerdfeger & Boysen, 2020). Avoiding traffic jams will be a logical option, as it increases carbon emissions in addition to the costs it generates (Wen & Li, 2016), and carbon emissions caused by last mile operations could be decreased up to 51,2% by using parcel lockers (Jiang et al., 2019).

2.2. Acceptance and Preference

Optimizing the locker network is evidently a strategical task, and it should not be considered separately from customer satisfaction. It should be kept in mind that while reducing cost is important, it depends on customer satisfaction which is influenced from maximum distance that customer is willing to take (Huang & Chen, 2016). It is seen that if customers have fixed delivery method preferences, operational costs and total distance traveled increase; therefore, it would be a clever maneuver to reward customers who are compatible with various delivery methods (Enthoven et al., 2020). One of the pressing factors that leads customers to prefer a locker can be named as convenient location (Guerrero-Lorente et al., 2020).

2.3. Locations

When choosing locker installation sites, high demand points should be considered in order to obtain high efficiency (Guerrero-Lorente et al., 2020). Also, high density urban areas and crowded residential complexes are other good locations to further secure the use of the lockers while bringing a solution to real estate problem for the locker installment (Iyer & Zhang, 2019). Safety and easy accessibility to lockers need to be taken into account for customers who do not use private transportation vehicles to reach the service stations (Lachapelle et al., 2018). According to Wang et al. (2020) movable locker units with few lockers are more suitable for scattered low demand area; and if the locker units have more lockers, fewer units will be necessary for covering demand.

3. PARCEL LOCKER APPLICATIONS IN TURKEY

3.1. Trendyol 7/24 Delivery Lockers

Trendyol, one of the biggest online shopping platforms in Turkey, announced its cargo vending machines in November 2020. The company, which aims to provide both an environmentally friendly solution and a contactless delivery experience for customers, also offered a 20 TL coupon to cabinet users to encourage the use of cabinets (Marketing Türkiye, 2020). Trendyol also uses the delivery locker networks of PTT, Yurtiçi Cargo, and Aras Cargo to serve its customers apart from its own lockers (Trendyol, 2022). In 2021, 500 cargo lockers were offered to customers in 7 provinces, and it is aimed to increase this number to 4 times by the end of 2022 and to provide services in 24 provinces in total (Garip, 2021).

Trendyol's cooperation on this issue was not limited to the listed cargo companies. BP started to serve as a delivery point in the field of e-commerce with its smart cargo cabinet service at various gas stations with heavy pedestrian traffic in cooperation with Trendyol in 2021. The service points have been determined as 40 points in 5 provinces as of August 2021, and this figure is planned to be over 100 in 20 provinces by the end of the year (Lojiport, 2021). Moreover, Apsiyon, a site management software company that currently serves 18,442 sites, (Apsiyon, 2022) announced at the beginning of 2022 that they are collaborating with Trendyol and that lockers will be placed on sites to make life easier for site residents. It is aimed to increase the number of cabinets, which was 5 as of the announcement, to 200 by the end of the year (Para, 2022).

3.2. Easy Point Express

Established by Mall Logistics in 2017, Easy Point aims to support users with delivery points and cargo lockers located at the busiest points of cities. Trendyol, Amazon, Hepsiburada, Morhipo, N11, DHL, Aras are listed as the companies they cooperate with (Easypoint, 2022a). Hepsiburada, which is another of Turkey's largest online shopping platforms, announced its Hepsimat delivery lockers (Easy Point Express) in December 2020 (Marketing Türkiye, 2020). While aiming to spread this service all over Turkey, it first started to serve in 5 locations in İstanbul, namely Beşiktaş, Moda, Kadıköy, Taksim, and Şişhane. Hepsiburada customers can choose one of the Easy Point Express delivery locker locations by using the "Send to Delivery Point" option (Horuz, 2020). In addition to working with many online shopping platforms, easy point express draws attention by offering users the ability to return products using the cabinets, and at the same time, the packages are covered by insurance for possible damage

and loss. As of now, Easy Point Express provides service at more than 100 points in Istanbul, Ankara, and Izmir (Easypoint, 2022b).

3.3. PTT Kargomat

The oldest locker application in our country was started by PTT in 2010, and a total of five cabinets, three in Ankara and two in Istanbul, were put into service for customers (PTT, 2010). However, this attempt was not successful, and the cabinets could not be operated efficiently. In 2017, the initiative was successful with the use of cabinets produced in cooperation with Turkish engineers and manufacturers, and the total number of cabinets reached 217 with the introduction of cabinets in İzmir, Bursa, and Antalya. Mass housing, metro stops, universities, student dormitories, shopping malls and squares stand out as the locations chosen for the placement of these lockers (Gökçe, 2021; Milliyet, 2019). In 2021, these numbers increased to 335 in 7 provinces with the cabinets installed in Eskişehir and Kocaeli provinces (Yıldız Ünal, 2021). As of 2022, PTT Kargomat provides service in a total of 9 provinces with one locker installed in Yalova and Hatay provinces and cooperates with companies such as Trendyol and Hepsiburada. An example of PTT Kargomat can be seen in Figure 2.

Figure 2: PTT kargomat (Yeşil, 2018, https://teknoseyir.com/durum/1096105).

3.4. Rovenma RovLocker

Rovenma is a company established in Ankara in 2016 with 100% domestic capital to produce delivery cabinets. It produces lockers used for services offered by companies such as PTT Kargomat, Trendyol 7/24, and Pudo. It is one of the few manufacturers in Turkey and in the world. The company also won two design awards from Turkey and Italy. While the company offers a modular design that can adapt to different places and conditions, it also produces in different sizes and dimensions in line with the demands of the customers. Design, development, hardware and software productions are carried out by the company's own teams. The research and design team carries out its work in Hacettepe Teknokent. With its software that provides ease of use to customers and logistics companies, it can be used with both mobile applications and smart watches. The ability to give commands via Bluetooth and

mobile app without a touch screen and to be used offline can be presented as advantageous features of the smart lockers produced. In addition, the company promises a high level of security with its own lock system (Rovenma, 2022). Finally, it should be noted that in 2021, the company stated that they received orders for 5,000 units for the next three years, and they predicted Turkey's need as 10,000 units for the next five years (Gökçe, 2021).

3.5. Pudo PudoBOX

Pudo, established in 2020, is an Istanbul based service company that provides innovative, sustainable, smart package delivery solutions and services supported by technology in order to create added value for the e-commerce business. Pudo is a location-independent, time-flexible smart delivery network model that works with the 'pick-up/ drop off' system. Users can track shipments instantly, list the closest pudoPOINTs, and manage shipment transactions through both Android and iOS compatible mobile applications (pudoAPP). PudoPOINTs are pick-and-drop points located in large residences and key locations in the cities. PudoPOINTs are divided into five categories according to the places where they are installed as pudoPOINT-H (housing complex), pudoPOINT-B (business centers – offices), pudoPOINT-S (shopping centers), pudoPOINT-R (retail), and pudoPOINT-C (University Campuses). Smart lockers are called PudoBOX, and the company continues its operations in 6 provinces, namely Istanbul, Ankara, Izmir, Bursa, Kocaeli, and Antalya, and plans to increase these figures. According to the company, the use of PudoBOX will reduce carbon dioxide emissions by 25%, city traffic by 15%, and logistics costs by 53% and provide significant fuel savings (Pudo, 2022).

3.6. Kargopark

Another smart locker manufacturer in Turkey is Kargopark, and the products have been developed with domestic software and technology. The company is located in Istanbul, Yıldız Technical University Davutpaşa Campus Technology Development Zone. Their first production started with the smart cargo cabinet produced for Borusan in 2015. While the company focused on site needs in 2016, they switched to a business model for the cargo sector in 2019. The company started cooperation with e-commerce companies and cargo companies in 2020 with the effect of the pandemic. Opet can be named as one of these significant cooperations which is announced in 2020 (Erkul Kaya, 2020).

As of 2022, the business’s products provide services at more than 150 points in 9 provinces. The firm offers 4 different product types focusing on different needs: Maxi, Eco, Mini, and Dropbox. While Maxi lockers are modular units produced according to the needs of customers, Eco models are low-energy lockers that operate without being connected to the electricity grid and the internet, using long-life batteries. Mini lockers are also products that work with low energy and have the feature of working with grid or solar energy. Dropboxes, on the other hand, are lockers that allow small businesses to drop off products or customers to return cargo (Kargopark, 2022).

3.7. Yurtiçi Kargo YK Plus 7/24 / Aras Kargo Aras Pratik 7/24

Yurtiçi Kargo launched the smart locker application in 2020. In May 2021, the company reported that there were YK plus 7/24 lockers at 50 different points throughout Turkey. In December 2021, it was announced that the number was close to 200 and that returns could be made with smart cargo lockers (Yurtiçi Kargo, 2021a; Yurtiçi Kargo, 2021b). It is known that

Aras cargo also has smart cargo lockers that can be used 24/7 at various locations (Topçu, 2022).

3.8. SWOT Analysis of Parcel Lockers in Turkey in General

A general SWOT analysis including parcel locker service providers and manufacturers in Turkey was made in the light of the information given in the previous sections and researches. The findings can be examined in Table 1 below.

Table 1: SWOT analysis of parcel lockers in Turkey in general.

Strengths	**Weaknesses**
The presence of two national companies producing lockers The fact that these companies do their own research and development for both hardware and software Modular production according to customer requirements Reduction in emissions, city traffic, fuel use, and logistics costs The ability of using the delivery lockers for returns	Not having a locker network spread across the country Insufficient promotion of delivery lockers
Opportunities	**Threats**
Increasing trend of e-commerce volume in Turkey Existing collaborations of e-commerce platforms with cargo locker service providers and manufacturers	The fact that this application is at the entry stage in Turkey The possibility that increasing e-commerce volume may generate more demand than the current locker network can handle

4. CONCLUSION

The increasing need for logistics services over the years and environmental and cost-oriented problems make the industry's need for alternative solutions undeniable. Parcel locker applications can meet some of these needs in harmony with the digitalizing world. As a result of this study, although the history of these practices in our country is not very old, it has been seen that both service providers and manufacturers are engaged in important activities. The number of locker networks and points in our country is not as high as in other countries mentioned in this study, but the fact that this practice is relatively new for our country justifies this situation, and it is thought that the numbers will increase in the coming years. The fact that service providers have plans to increase these numbers and their collaborations with different sectors coincide with this idea.

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