

## Analisis efektivitas sistem pengiriman parcel locker pada last mile delivery berdasarkan aspek eksternalitas = Analysis of effectiveness of parcel locker delivery system within the last mile delivery based on externalities aspect

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### Abstrak

Indonesia menduduki peringkat pertama sebagai negara dengan pertumbuhan e-commerce paling pesat, dengan tingkat pertumbuhan sebesar 78% di tahun 2018. Salah satu jenis e-commerce yang turut berkembang secara pesat adalah jenis B2C (Business-to-Customer), yaitu salah satu jenis e-commerce yang memasarkan barang dari pihak produsen secara langsung ke pihak konsumen sehingga jenis pengiriman yang menunjang proses ini adalah pengiriman home delivery. Akibat permintaan akan konsep bisnis B2C yang juga semakin melonjak, terjadi kekompetitifan antar penyedia jasa pengiriman home delivery sehingga segmen last mile pada proses pengiriman barang menjadi terfragmentasi. Selain itu, terjadi juga berbagai kegagalan pengiriman dari sistem home delivery sehingga sistem ini menjadi kurang efektif pada segmen last mile. Sistem parcel locker hadir untuk memperbaiki ketidakefektifan yang disebabkan oleh sistem pengiriman home delivery. Di sisi lain, walaupun sejumlah usaha telah diupayakan untuk meningkatkan efektivitas, perencanaan sistem pengiriman barang belum mempertimbangkan dampak buruk yang ditimbulkan, salah satunya terhadap lingkungan. Dampak ini disebut eksternalitas, yaitu dampak yang dirasakan oleh pihak yang tidak terlibat langsung dalam aktivitas pengiriman barang. Aspek eksternalitas direpresentasikan menjadi biaya eksternal. Penelitian ini bertujuan untuk mengaji efektivitas sistem pengiriman parcel locker berdasarkan biaya eksternal yang harus dibayarkan. Dalam melakukan penelitian, pertama dilakukan identifikasi besarnya biaya eksternal pada sistem pengiriman home delivery. Selanjutnya, dilakukan identifikasi besarnya biaya eksternal pada sistem pengiriman parcel locker. Efektivitas direpresentasikan sebagai perbandingan antara biaya eksternal dari sistem parcel locker dan home delivery. Maka, dilakukan perbandingan antara kedua variabel tersebut untuk menentukan efektivitas dari sistem pengiriman parcel locker. Hasil penelitian menunjukkan bahwa home delivery 3 kali lebih efektif untuk aktivitas tinggi dan 7 kali efektif untuk aktivitas rendah.

.....Indonesia is first-ranked as the country with the fastest e-commerce growth throughout the world with its 78% growth rate in 2018. One of the e-commerce means profoundly affected by this case is B2C (Business to Customer), which refers to a process of marketing the products from its sellers directly to the aimed customers implying that home delivery is considered as the most relevant delivery system. Due to the considerably ever-rising demand for B2C, competitiveness occurs among various logistic providers as a means to meet the customers' needs of the delivery process. Consequently, customers engage various logistic providers so that the last segment of the whole process<sup>3</sup>/<sub>4</sub>last-mile segment<sup>3</sup>/<sub>4</sub>turns out to be substantially fragmented. Also, it is aggravated by the multiple failed deliveries ensuring that home delivery is no longer reflected to be adequately effective within the last-mile segment. Parcel locker, as one of the innovative delivery systems, is presented to be one of the solutions to the aforementioned home delivery issues. Parcel locker consists of three categories and one of those three is an operational locker that is equipped with a well-managed time slot. On the contrary, despite the effort attempted to increase the

effectiveness of the delivery process, the planning for the delivery system commonly has not completely taken the caused negative environmental effects into account. These effects are categorized as externalities that affect a third party who did not choose to involve in the delivery process. These externalities are represented by external costs. This research aims to determine the effectiveness of parcel locker based on its caused environmental externalities. First, we identify the external costs resulting from the home delivery process. Then, with the same methodology, we identify the external costs caused by the parcel locker. Effectiveness is given by the comparison between the external costs caused by parcel locker and home delivery. Finally, we compare those two results from the previous two steps to identify the effectiveness of parcel lockers based on its caused externalities. The result shows that home delivery is 3 times more effective for high shipment activity and 7 times more effective for low shipment activity.<i/>