

5. Conclusions

The research presented in this paper concerns the analysis of the emerging services related to online meal ordering delivery, and their supply chain network. It recognises the location of depot points in the city as essential for the satisfactory operation of the food ordering and delivery system. At the end, the paper provides the formulation of a model that gives suggestion on the optimal position of the depots, assuring that the total travelled distance is limited, maximising the number of the platforms' potential customers.

A natural extension of the proposed model is the multi-carrier case, as all the platforms operate with a high number of personnel. Thus, after having defined the location of the depots, it would be coherent defining the size of the fleets in each depot. Cost functions can also be exploited. The model takes into account only a single fixed cost related to the activation of each node, but it can be considered that the carriers' wage depends on the number of shipment they perform and thus define cost of depots taking into account the number of customers that can be reached from each depot can help the service provider to have a more realistic view.

Moreover, the quality of the solution could be evaluated comparing the proposed model's solution with a different approach, in which there is no a predefined space for the waiting time and carriers ride in the city.

Further research may focus also on improving the model considering other aspects of the quality of the service. The model we proposed addresses the time constraint, ensuring that the platforms can reach the largest market possible within that time. Nevertheless, this focus is not the unique of a service provider: it is important for companies to satisfy the client to retain current customers and attract new ones leveraging on different factors. More specific, in this case, it is possible to consider the quality of the service in relation to the number of different restaurants that can reach a single customer, providing to him a variety of choice.

References

- Cagliano, A. C., Gobbato, L., Tadei, R., & Perboli, G. (2014). ITS for E-grocery Business: The Simulation and Optimization of Urban Logistics Project. *Transportation Research Procedia*, 3, 489–498. <https://doi.org/10.1016/j.trpro.2014.10.030>
- Chen, H., Campbell, A. M., & Thomas, B. W. (2008). Network design for time-constrained delivery. *Naval Research Logistics*, 55(6), 493–515. <https://doi.org/10.1002/nav.20302>
- Church, R., & Reville, C. (1974). The maximal covering location problem. *The Regional Science Association*, 32. <https://doi.org/10.1111/j.1435-5597.1974.tb00902.x>
- Devaraj, S., Fan, M., & Kohli, R. (2002). Antecedents Satisfaction and of B2C Preference : Channel Validating. *Information Systems Research*, 13(3), 316–333. <https://doi.org/10.1287/isre.13.3.316.77>
- Emeç, U., Çatay, B., & Bozkaya, B. (2016). An Adaptive Large Neighborhood Search for an E-grocery Delivery Routing Problem. *Computers & Operations Research*, 69, 109–125. <https://doi.org/10.1016/j.cor.2015.11.008>
- Farahani, R. Z., Rezapour, S., Drezner, T., & Fallah, S. (2014). Competitive supply chain network design: An overview of classifications, models, solution techniques and applications. *Omega (United Kingdom)*, 45(January 2017), 92–118. <https://doi.org/10.1016/j.omega.2013.08.006>
- Li, X., Zhao, Z., Zhu, X., & Wyatt, T. (2011). Covering models and optimization techniques for emergency response facility location and planning: a review. *Mathematical Methods of Operations Research*, 74(3), 281–310. <https://doi.org/10.1007/s00186-011-0363-4>
- Melo, M. T., Nickel, S., & Saldanha-da-Gama, F. (2009). Facility location and supply chain management - A review. *European Journal of Operational Research*, 196(2), 401–412. <https://doi.org/10.1016/j.ejor.2008.05.007>
- Mignot, M. (2015, July 11). The Food Delivery Wars | Index Ventures. *TechCrunch*.
- Parragh, S. N., Doerner, K. F., & Hartl, R. F. (2008). A survey on pickup and delivery problems Part I: Transportation between customers and depot.
- Paton, G. (2017). Cold pizza for dinner as food courier fails to deliver. *The Times*.
- Punakivi, M., & Saranen, J. (2001). Identifying the success factors in e-grocery home delivery. *International Journal of Retail & Distribution Management*, 29(4), 156–163. <https://doi.org/10.1108/09590550110387953>
- Savelsbergh, M. W. P., & Sol, M. (1995). The General Pickup and Delivery Problem. *Transportation Science*, 29(1), 17–29. <https://doi.org/10.1287/trsc.29.1.17>
- Stern, S. (2016). The “gig economy” brings with it a human cost; Deliveroo and other high-end takeaway delivery services might improve consumer choice, but low wages and little job security are the downside. *The Guardian*.
- Tobing, R. D. H. (2016). A food ordering system with delivery routing optimization using global positioning system (GPS) technology and google maps. *Indonesian Journal of ICT and Internet Development*, 8(1), 17–21.
- Yanik, S., Bozkaya, B., & deKervenoael, R. (2014). A new VRPPD model and a hybrid heuristic solution approach for e-tailing. *European Journal of Operational Research*, 236(3), 879–890. <https://doi.org/10.1016/j.ejor.2013.05.023>