

Chapter 9

Use of Data Analytics to Increase the Efficiency of Last Mile Logistics for Ecommerce Deliveries

Gaurav Nagpal

 <https://orcid.org/0000-0003-1957-7865>

Birla Institute of Technology and Science, Pilani, India

Gaurav Kumar Bishnoi

Birla Institute of Technology and Science, Pilani, India

Harman Singh Dhami

Birla Institute of Technology and Science, Pilani, India

Akshat Vijayvargia

Birla Institute of Technology and Science, Pilani, India

ABSTRACT

With the increasing share of digital transactions in the business, the way of operating the businesses has changed drastically, leading to an immense opportunity for achieving the operational excellence in the digital transactions. This chapter focusses on the ways of using data science to improve the operational efficiency of the last mile leg in the delivery shipments for e-commerce. Some of these avenues are predicting the attrition of field executives, identification of fake delivery attempts, reduction of mis-routing, identification of bad addresses, more effective resolution of weight disputes with the clients, reverse geo-coding for locality mapping, etc. The chapter also discusses the caution to be exercised in the use of data science, and the flip side of trying to quantify and dissect the phenomenon that is so complex and subjective in nature.

DOI: 10.4018/978-1-7998-3053-5.ch009

INTRODUCTION

The ecommerce industry has witnessed an exponential growth globally in the past decade. This is the industry of the future, by virtue of the value-add it can provide to the customers. The ecommerce value chain is highly responsive to the customer, and a source of convenient sourcing for him. The ecommerce transactions also result in lesser costs related to inventory carrying, and have a faster inventory turnover. But the last mile logistics cost in such transactions is significantly higher as a percentage of the gross merchandise value of the goods sold. If this cost can be reduced, it can work wonders for this industry.

The logistics sector is not only one of the major contributor to the GDP (Gross Domestic Product) of the nations, but is also a driver for the entire economy since the movement of goods (that ultimately drives the economy) is dependent upon this sector. However, since times, the logistics has been an unorganized industry, which is now being transformed to help the clients achieve their goals. The streamlined logistics can be a major source of competitive advantage for any organization. The organizations, these days, have been outsourcing the logistics function to the specialized logistics services providers so that they can focus more on their core strengths. In order to improve the operational performance of any industry, it becomes paramount to use the data driven approach for structured decision making. Also, the nature of problems is complex and unstructured, which makes the use of structured decision making very important. This scientific decision making can come from the use of data analytics. It is here that data analytics has a big role to play.

Fortunately, the scale of transactions in ecommerce makes sure that we have the plenty of data available from them, which can be used to validate the relevance of the problem statement, generate important insights, arrive at the solutions, implement them, learn from the implementation and improvise the solutions further in a journey of continuous excellence. The data generated by the ecommerce transactions has a significant scale to provide the necessary insights which can be leveraged to achieve the process improvements related to different aspects.

There are multiple ways in which the data can be leveraged. A few of them can be predicting the attrition of the field executives (here-after referred to as FEs), identification of fake delivery attempts by the FEs, reducing the misrouting of the shipments, resolving the weight dispute issues in the shipments, optimizing the delivery route of the field executives, identifying the bad addresses on the shipments, geocoding of the addresses, exploring the economic comparison between fixed staff model and variable staff model, etc.

In this paper, the current Section lays down the motivation for the research. The review of the literature has been performed in the Section 2, and the nine examples of the above mentioned applications of data science have been explained in Section 3, along with the detailed elaboration of the first two applications and the findings of the real-life implementations in firms practicing the last mile deliveries. The Section 4 concludes the paper stating the overall benefits and risks that come with the use of data science in last mile logistics.

LITERATURE REVIEW

The optimization of logistics decisions has become indispensable with the increased movement of goods and services across the geographies in globalized trade (Langevin and Riopel, 2005). Koul and Verma (2011) used advanced analytics to consider the influence of the uncertainties tied to the human cogni-

12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/use-of-data-analytics-to-increase-the-efficiency-of-last-mile-logistics-for-ecommerce-deliveries/264309

Related Content

View Materialization Over Big Data

Akshay Kumar and T. V. Vijay Kumar (2021). *International Journal of Data Analytics* (pp. 61-85).
www.irma-international.org/article/view-materialization-over-big-data/272109

Sentiment Analysis and Stance Detection in Turkish Tweets About COVID-19 Vaccination

Doan Küçük and Nursal Arc (2022). *Handbook of Research on Opinion Mining and Text Analytics on Literary Works and Social Media* (pp. 371-387).
www.irma-international.org/chapter/sentiment-analysis-and-stance-detection-in-turkish-tweets-about-covid-19-vaccination/298880

Perspectives of Fuzzy Logic and Their Applications

Shivlal Mewada (2021). *International Journal of Data Analytics* (pp. 99-145).
www.irma-international.org/article/perspectives-of-fuzzy-logic-and-their-applications/272111

Selected Topics in Robust Optimization

Ihsan Yanikoglu (2018). *Optimization Techniques for Problem Solving in Uncertainty* (pp. 140-166).
www.irma-international.org/chapter/selected-topics-in-robust-optimization/206633

Measuring Employee Happiness Index in the Modern Workplace

Surjit Singha (2023). *HR Analytics in an Era of Rapid Automation* (pp. 272-299).
www.irma-international.org/chapter/measuring-employee-happiness-index-in-the-modern-workplace/327759