

Chapter 39

Dynamic Behavior Analysis of Railway Passengers

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ABSTRACT

This chapter discusses mainly on dynamic behavior of railway passengers by using twitter data during regular and emergency situations. Social network data is providing dynamic and realistic data in various fields. As per the current chapter theme, if the twitter data of railway field is considered then it can be used for enhancement of railway services. Using this data, a comprehensive framework for modeling passenger tweets data which incorporates passenger opinions towards facilities provided by railways are discussed. The major issues elaborated regarding dynamic data extraction, preparation of twitter text content and text processing for finding sentiment levels is presented by two case studies; which are sentiment analysis on passenger's opinions about quality of railway services and identification of passenger travel demands using geotagged twitter data. The sentiment analysis ascertains passenger opinions towards facilities provided by railways either positive or negative based on their journey experiences.

INTRODUCTION

Considering the advancement in technology by 2050 the railway industry would be able to address competitive pricing, passenger desirable time slots, excellent customer service, and effective emergency services using a dynamic behavior analysis. The railway industry is often thought as conservative; it is necessary to proceed with the foresight to hold creative thinking beyond projecting the present into the future. This thought piece focuses on the passenger experiences, which are anticipated here and are designed to generate a discussion about the future. It provides a big picture in taking dynamic decisions by the rail industry and governments.

Passengers are increasingly able to access data from anywhere through smart devices and cloud applications. As a result, faster access to data will influence passenger relationship with transportation, as well as their decision-making process. Passengers will expect the services certainty in terms of time, so reliable and accurate real-time information will be a key issue. Customer centric services will be based on a wealth of information about the individual passenger and their needs at that moment. These require a detailed understanding and analysis of the passenger experience measures and their satisfaction with key elements of their journey. This analysis would be used to identify satisfaction or dissatisfaction, to provide the feedback with guidance on those areas of improvement.

National Rail Passenger Survey (NRPS) enables rail operators to compare their service with others and to identify the areas of improvement. The department of transport uses this information to evaluate Train Operating Companies (TOCS), which is an official statistic on operator's service. Along with this statistic, big data analysis would play a vital role in the processing of the data collected from social networks. Twitter is one of the primary sources of informal data repository. While considering the previous survey reports there has been a long-term downward trend in the overall complaints rate through traditional channels. It has been attributed to passengers moving towards social media to complain about their train operators relatively than using more traditional methods. Due to the differences in approach to social media, recording complaints through this are not possible at present but should be considered as a long-term goal. The size of the customer base that interacts with the train operators through social media means that their feedback is a very rich source of information to be recorded. By working with train operators and social media analysts we can explore suitable measures that record categorization or sentiment of feedback through social media. The purpose of this analysis would be to identify the data which would help in gauging how train operators approach social media for passenger engagement and complaints perspective. Many have been working with the train operators to learn more about their approach to social media, which has opened opportunities in several different areas. Including time and resource dedicated to social media, the level of engagement, recording feedback. Based on the survey results, the report focus is on any commonality in train operator's approach to social media and it is feasible to record complaints through this channel, observing some of the major challenges in finding a reliable measure, including passenger behavior towards social media and assessing sentiment of feedback.

The main objective of this chapter is to understand the passenger behavior dynamically by using twitter data. This chapter mainly concentrates on extraction of dynamic data from social media, identification of the relevant hashtags of railway passengers, preprocessing on twitter data to remove unwanted text and symbols, identification of list of task-relevant words that define positive as well as negative opinion, preparation of word plots to find major discussions and sentiment analysis on passenger's opinion.

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