Data Analytics for DHL Logistics Facilities

LITERATURE SURVEY

A Literature Review of Data Analytics for DHL Logistics Facilities

Abstract

Advances in technology enable companies to collect and analysis data, which were previously not accessible, to either enhance existing business processes or create new ones. The purpose of this paper is to document the role and impact of Big Data Analytics (BDA), and the Internet of Things (IoT), in supporting a large logistics firm's strategy to improve driver safety, lower operating costs, and reduce the environmental impact of their vehicles.

Design/Methodology/Approach

A single case with embedded units intrinsic case study method was adopted for this research and data were collected from a "real-life" situation, to create new knowledge about this emerging phenomenon.

Findings

Truck telematics were utilized in order to better understand, and improve, driving behaviour. Remote control centre monitor live sensor data from the company's fleet of vehicles, capturing the likes of speed, location, braking, and engine data, to inform future training programs. A combination of truck telematics and geo-information are being used to enable proactive alerts to be sent to drivers regarding possible upcoming hazards. Camera-based technologies have been adopted to improve driver safety, and

fatigue management, capturing evidence of important driving events and storing data directly to the cloud, and BDA is also being used to improve truck routing, recommend optimal fuel purchasing times/locations, and to forecast predictive and proactive maintenance schedules.

Research Limitations/Implications

The type of data collected by Company A, and similar logistics companies, has the potential to greatly inform researchers investigating autonomous vehicles, smart cities, and the physical internet.

Practical implications

Eco-driving, a practice informed/improved by BDA at Company A, has been linked to reductions in fuel consumption and CO_2 emissions, which bring both economic and environmental benefits. Technologies similar to Truck cam are growing in popularity in some parts of the world, to the point where it is now common practice to use dashcam assess of accidents to establish liability. This has implications for logistics firms, in other parts of the world, where such practices might not yet be so commonplace, and for drivers and society more broadly.

Social implications

Improvements in utilization and routing have the potential to reduce traffic congestion, which is responsible for losses in productivity, increases in fuel consumption, air pollution and noise, and can incite stress, aggression, anger and unsafe behaviours in drivers. Predictive analytics, which generate refuelling and maintenance schedules, have the potential to be adopted by all vehicle manufacturers, and could generate reductions in customer fuel costs, whilst improving the performance, efficiency, and life expectancy of future motor all vehicles. The high probability of occupations in the logistics industry being replaced by computer automation in the near future is also discussed.

Originality/value

The findings from this research serve as a valuable case example of a real-world deployment of BDA and IoT technologies in the logistics industry, and present implications for practitioners, researchers, and society more widely.

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