Robotics in Last Mile Delivery
Is it Worth the Resources to Implement Robotics in Last Mile Delivery?

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Abstract

The innovation hype surrounding autonomous delivery devices has the logistics industry striving to implement automated last mile delivery strategies. While there are few instances of drones making door step deliveries today, the possibility of such deliveries becoming a common occurrence is certainly on the horizon. With no concrete published data proving that drone doorstep delivery is better than the usual truck and delivery man, the question to be answered is it worth the resources to implement robotics in the last mile delivery? The purpose of this research study is to explore how the use of robotic delivery devices impact supply chains in order to determine if the use of robotics is worth the investment.

Research Question

Is it worth the resources to implement robotics in last mile delivery strategies?

Introduction

The goal of any successful business is to minimize costs while maximizing profits. Supply chain is the driving function behind this philosophy and last mile delivery tends to be the most expensive component of the function, accounting for upwards of 55% of shipping costs. With the rapid growth of e-commerce and customers' expectations for same day delivery, logistics companies are scrambling to improve last mile delivery strategies to not only cut costs but enhance customer satisfaction.

Current literature covers how robotics are currently being implemented, the types of robotics being developed for new delivery strategies, and the theoretical benefits and costs of undertaking the implementation of robotics in last mile delivery.

The purpose of this study is to gather experts' opinions on the topic to provide industry with possible uses and impacts of the utilization of robotics in last mile delivery.

Methodology

In order to best understand what a world with robotics in last mile delivery would be like, we interviewed industry and academic experts. To best protect our participants' identities and privacy, we ensured our study complied with the Institutional Review Board (IRB). As a result, eight experts with varied experiences were recruited and assigned an alias for their interviews as to not assign a company name to their statements and possibly jeopardize their employment or company's reputation. Through the use of open-ended qualitative interview questions, individual interviews were semi-structured and probing questions were used to capture experts' opinions. These experts provided us with theoretical saturation of data because interviewing a sample size of eight participants allowed us to identify and verify recurring themes.

Results

All of the experts explicitly answered our overarching research question and six key themes emerged through qualitative data analysis.

Key Themes
ROI is Dependent on Customer Value
Costs Can Only be Theorized at This Point
Location and Density Determine Value
Potentially More Sustainable
Human Labor Reallocation
Regulation is a Necessity

Is it worth the resources to implement robotics in last mile delivery?				
Participant	**Yes**	**Depends**	**No**	**Justification**
Supply Chain Expert 1		✓		Dependent on the scale of operations and the cost benefit analysis per situation.
Supply Chain Expert 2		✓		Dependent on technological capabilities so for the foreseeable future, humans combined with technology is best.
Supply Chain Expert 3		✓		Dependent on whether the robotics aid in gaining a competitive advantage and support corporate strategy.
Supply Chain Expert 4	✓			Yes, because robotics cost less than people.
Supply Chain Expert 5	✓			Yes, because robotics allow companies to reach previously unreached demographics to provide healthcare and other needed services.
Industry Expert 1	✓			Yes, because robotics are likely to double productivity and generate revenue.
Industry Expert 2	✓			Yes, because robotics allow companies to service people in need faster.
Industry Expert 3		✓		Dependent on package size and how much customers value same day delivery.
Total	4	4	0	

Conclusion

Our open-ended interview methodology allowed eight experts with various experiences to answer and elaborate on subtopics regarding robotics in last mile delivery. Upon analysis of the qualitative data collected, this research study found that it is largely possibly for robotics in last mile delivery to shorten delivery times, making same day delivery a reality and, therefore, substantially contribute to companies' bottom lines.

In addition to revenue generation, robotics in last mile delivery could be a more environmentally sustainable delivery option and create jobs we have not yet conceived of while simultaneously providing humans with more time for value-added work.

Despite being constrained by proprietary information regarding the financials and technology surrounding this topic, we have provided readers with a comprehensive view of what a world with robotics in last mile delivery would look like.

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