

Logistics, trade and customer decisions in the age of the Internet

Description for the General Public

In the last twenty years the Internet has expanded rapidly and the present generation has a huge amount of information at its fingertips. This has made a huge impact on the way in which firms and consumers act. The Internet is crucial in a firm's logistics chain and interactions with clients. The past decade has also seen the rapid rise of firms who carry out all their consumer trade via the Internet.

From the point of view of a consumer looking to purchase a good, the Internet gives him/her the opportunity of comparing prices and obtaining the opinions of previous buyers rapidly and from the comfort of one's home. However, this comes with various problems. Consumers may face "information overload" and methods of filtering the information provided by the Internet are useful when making important purchasing decisions. When purchasing more everyday goods, Internet customers do not have the opportunity to physically observe a product before ordering it. Using mathematical models, as well as computer algorithms and simulations, this project will derive and investigate the effectiveness of robust rules for solving the problem of purchasing a valuable resource with the aid of an initial search via the Internet. Such rules should both limit the amount of information a decision maker has to process/store and ensure that the final decision made is close to optimal. A similar process will be used to investigate rules for solving the problem of making everyday purchases on the Internet when it is not possible to physically observe a product before an order is made.

The Internet has also revolutionised the logistics chain of companies and their relationships with customers. Thanks to the Internet, firms now have up to the minute information about the level of stocks and orders available in real time. This has led to the rapid rise of firms who carry out all their business transactions with customers via the Internet, e.g. Amazon. Although Amazon cooperates with other firms to supply goods to customers, they store many of the products that they sell and send these products to customers from their own warehouses. The last decade has seen a rise in the practice of drop shipping. This is a logistics model which involves transferring the role of physically supplying a good from an Internet seller onto a supplier (wholesaler, producer or specialised logistics firm). The role of the Internet seller is reduced to taking orders and transferring them to the supplier, who then delivers the goods to the client. This model significantly reduces the logistics costs of the Internet shop, since it does not have to store goods. It also brings gains to the producer/distributor, since it can concentrate on its core business and gain additional income via cooperating with the Internet seller. Since the logistics firm and the producer need to ensure their own profits while maintaining cooperation, the behaviour of these firms will be analysed using game theory. The project will also look at the problem of ensuring supply to consumers, which is made difficult by the fact that the Internet shop does not have control over its stock levels. Finally, the project will analyse how the Internet can be used in creating more efficient logistic chains, particularly achieving control over stock levels and managing the effect of the customer's right to return a good when drop shipping is used. This will affect the pricing policy of a producer who both uses an intermediary and sells directly to the public. For example, if there is a difference between the prices at which a good from the same producer is sold, then a customer may return a good to the producer and order it from another source (but from the same producer) at the lower price. This would result in unnecessary shipping costs.

Naturally, the behaviour of consumers and sellers is interlinked and thus the project ultimately aims to analyse Internet trading via the use of game theory, which assumes that consumers act optimally given the strategies of the sellers and vice versa.