

# CASE STUDY AMAZON – DIGITAL KING<sup>1</sup>

I check my email in the morning, and there is the usual email from Amazon. I wonder what it is they are recommending I buy this time. I open up the email and smile. They are recommending I buy Managerial Economics by Nick Wilkinson. Amazon's advanced data analytics are not quite sophisticated enough to know that they are sending an email to the author of the book, who is therefore unlikely to be buying it. However, Amazon's data base and data analytics are among the best in the retail business, and this has been the key to their enormous success in the retail sector.

Amazon is a prominent example of a firm that has emerged since 2000 with a radically new business model. This model was based on the insight that success in retail did not require having an infrastructure of outlets. Goods can be purchased from manufacturers, stored in warehouses and delivered to customers on demand. Amazon prides itself on 'selling everything from A to Z'. Like various other new business models this was a highly disruptive strategy, causing huge changes in the industry, as other retailers were forced to adopt similar methods or go out of business. According to Ben Schachter, an analyst at US investment bank Macquarie, Amazon accounted for 26 cents out of every dollar spent online in 2015. Its revenue has been growing at 20% a year, and by 2017 amounted to nearly \$178 billion<sup>5</sup>.

Amazon realized that for its business model to operate well there was a need for an IT system that could deal with masses of data and make use of advanced data analytics. This was necessary for both revenue management (RM) and cost management (CM). To this purpose they have two acres of underground servers, manned by 16 experts and 1,400 developers, whose job is to develop automated algorithms by crunching masses of customer purchase data.

On the RM side, these algorithms allow Amazon to implement a system of customized pricing, with individual prices for different customers depending on a range of factors: supply, demand, the customer's purchasing history, competitors' prices and strategy initiatives, such as Prime Day. Amazon is by no means a pioneer in terms of customized

---

<sup>1</sup> Nick Wilkinson, Managerial Economics, Problem-Solving in a Digital World (see the syllabus of the course)

pricing, since airlines have been implementing aspects of this since the 1970s. Airlines concentrated on using dynamic inventory pricing, where ticket prices depended on how many seats were left unfilled at any time on its flights. Over time their RM has become more sophisticated, with data analytics providing information on market segment key characteristics. Thus airlines could determine which customers were once-a-year vacation flyers, and which were weekly business flyers, allowing prices to vary accordingly.

However, in some important areas the airlines now lag behind Amazon in terms of data analytics. For one thing their data tends to be siloed in different departments, as is the case for many firms. Thus, RM departments often lack access to data available to sales and marketing departments, with no integration of data management within the firm as a whole. This is not optimal when it comes to maximizing revenue. Another area where Amazon is superior is in its product bundling. Whereas airlines have tended to use data analytics that concentrate on selling individual tickets, they have ignored the potential for such analytics to maximise revenue from charging for baggage checking, meals, and preferential seating. Amazon on the other hand has developed sophisticated algorithms that make product recommendations to customers based on past purchasing patterns, show them what other customers buying the product have also bought (usually complements), and offer them bundles of related products. These bundles are based on sound psychology, so that the main product in the bundle may be offered at a discount, while the others are at a normal price with a significant profit margin. Psychological studies of consumer behavior indicate that, once a purchasing trigger has been activated, consumers shift into a different mental frame and are more willing to buy other goods.

Another business practice which Amazon has borrowed from the airlines, and developed further, is to offer special deals for regular purchasers. Instead of having frequent flyer clubs they operate an Amazon Prime membership. This is again based on market segmentation related to buyer characteristics. Amazon in the US has found that Prime customers spend about two-and-a-half times the amount of other customers annually (around \$1500 compared with \$625 in 2015). For a fixed fee, currently £7.99 per month in the UK, they offer a number of advantages: prior access to special deals, superior downloading of video and audio products, plus written media, and unlimited

one-day delivery. The advantages of Prime membership are well-publicized, particularly with Amazon Prime Day. Originally this special promotion was simply aimed at offering deals to attract new customers, but in 2018 Amazon introduced a new aspect of this strategy: offering particularly high discounts of 23% to 50% on domestic hardware devices, notably Echo, the Fire TV Stick and Kindle, to lock consumers into the Amazon ecosystem of products, services and media for further purchases over the long term. This proved a highly successful move, with over 100 million items sold, an increase of 6% on the previous year, and 121% up on the previous week. The Prime Day event is now offered in 17 countries<sup>6</sup>.

A further business practice implemented by Amazon, based on data analytics, concerns market testing, sometimes referred to as A/B testing. Sometimes certain deals will be available in specific areas but not in others. This is essentially a field experiment, and allows the firm to evaluate the impact of the deal in terms of purchasing behavior. Precise predictions are possible because of the controlled nature of the experiment, and this in turn enables the firm to maximize revenue.

Amazon has introduced a number of other innovative aspects of its services which generate revenue, such as Mechanical Turk, which acts as an online labour market: businesses that have 'human intelligence tasks,' or HITs, that need to be performed can engage with suppliers of labor who can perform these tasks remotely. Another innovation is its Echo product, Alexa, that acts as a virtual assistant, and can perform various domestic duties on oral command, such as operating the sound system, lighting and heating, controlling cooking devices or shopping.

Although Amazon is best known to the general public for its services on the demand side, it has been just as innovative in terms of supply chain management. The firm has revolutionized warehousing and distribution networks, again using a highly digital approach. Data analytics are also very useful on the cost management (CM) side. Amazon's business model involves sophisticated inventory management and logistics in order to minimize costs and optimize customer convenience. The majority of sales, over 80%, from its warehouses, referred to as 'Fulfilment centers', are actually third-party sales, so it outsources this aspect of inventory management, while offering services to these third-parties such as customer services, delivery and dealing with returns. This makes it attractive for these usually small operators to sell their products via the

Amazon platform.

However, Amazon insources its logistics. This aspect of strategy, linked to warehousing, has been vital to its success, in terms of location, size, number and organization. Thus Amazon has been increasing the number of its warehouses near metropolitan centers to minimize transportation time and cost, while its larger storage facilities, up to 1.2 million square feet (110,000 square meters), are more distant. More recently Amazon has modified its strategy so that it can include pick-up from manufacturers as well as delivery, thus reducing warehousing needs.

The organization of its warehouses has also been a game-changer in retailing, involving increasing use of automation and robotics. In 2012 Amazon acquired Kiva Systems, since rebranded as Amazon Robotics. Inbound goods are initially stowed, using a counterintuitive 'random stow' system, based on algorithms that analyses and forecast demand frequency. The system is designed to reduce mistakes and bottlenecks. Robots are currently used for much of the lifting and transportation, along with conveyor belts, and robots will soon be used for picking as well. Employees make use of mobile data collection (MDC) which reduces labour time in terms of entering data, and means that back-end systems for integrating data can be updated in real time. After stowing and picking, goods are rebinned (combining multiple items for more efficient shipping), and packed. They then enter a SLAM (scan, label, apply and manifest) automated system, which weighs the packages to ensure they are the correct weight for their intended contents and acts as a quality control device. The packages are then diverted to their various shipping areas according to destination. Different warehouses are used for different types of good, depending on factors such as order frequency, type of good, destination and type of delivery. In December 2016 the first delivery was made by drone, in Cambridge, UK, taking 13 minutes from order to delivery. Many retail experts believe drone delivery will not be a game-changer, but delivery by autonomous vehicle (AV) may indeed be one (see the previous case study).

A further aspect of Amazon's diversification strategy relates to its increasing involvement in manufacturing. For example, Amazon now makes batteries, Bluetooth

speakers and backpacks, among other things. It found that it could produce many of the products it was selling for third-parties more cheaply by taking advantage of the economies of scale offered by its huge sales volume. Thus, it is now engaging in backward integration with its suppliers, entailing more ownership of physical infrastructure than its core e-commerce business normally requires.

Perhaps the most controversial aspect of Amazon's recent diversification strategy has been its announcement of its acquisition of Whole Foods in June 2017, for \$13.7 billion. It is proposing to sell Whole Foods products both instore and online. With the aid of improved efficiency in terms of logistics Amazon is intending to sell some of these products at a lower price than previously, which would be consistent with its general market penetration strategy. It is also intending to introduce more digitization into the stores, for example by using automated checkouts.

Diversification is not the only element of Amazon's strategy that has proved controversial; there has been increasing media attention regarding its attitude towards and treatment of its workforce. This issue is discussed in the next chapter in the context of firms' objectives and social responsibility.

However, these aspects of Amazon's strategy have attracted unwelcome attention from politicians and regulators, both in the US and Europe. In the US there is now a somewhat bizarre alliance of democrats and President Trump. Some democrats are concerned about increasing concentration and reduced competition in various industries, such as airlines, banking and telecommunications, and these are legitimate economic issues that are discussed later in the text. On the other hand, Trump, whose tweets do not indicate any real understanding of economic principles, appears to have personal issues related to the company founder, Jeff Bezos. With regard to Amazon, as with the coal and steel industries, and other industries, the president has a strong Luddite streak, wanting to return to a past and supposedly better era. Given the chaos at the heart of White House policy under the present administration, it is difficult to predict how this will affect Amazon's future.

It can now be seen that recent trends at Amazon are significant for a number of areas within managerial economics: objectives of firms; demand and revenue management; supply and cost management; business strategy and diversification; competition strategy; and regulation policy. All these areas are discussed in detail throughout the

remainder of the text.

#### Questions

1. Explain how Amazon's business model is different from a traditional one.
2. Compare and contrast Amazon's revenue management strategy with that used by airlines.
3. Explain how Amazon has digitized its supply chain.
4. Describe possible synergies for Amazon's acquisition of Whole Foods.
5. Explain why regulators are concerned about Amazon's current situation.