Technology and change in postal services – impacts on consumers

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Executive Summary

Introduction

The aim of this study is to provide an overview of the current technological developments in the postal market and assess the potential future impact of various technologies and innovations on the market, and on British consumers in particular. It also considers the issues that might arise for consumer protection authorities and possible actions to take.

The study was conducted by WIK-Consult and ITA Consulting on behalf of Citizens Advice between September and November 2015, using a mix of desk research, expert interviews and own analysis. Our findings are based on extensive research and literature review, validated during interviews with 15 delivery companies, stakeholders, and experts based on a questionnaire.

Background

Digitalisation has changed the role of the postal sector as mail volumes decline and parcel volumes grow. In the UK mail market, volumes have steadily declined for years, although this drop has slowed somewhat in recent years, while revenues have risen slightly, mostly due to price increases. Royal Mail remains the dominant operator, especially as the only end-to-end competitor has stopped delivery operations. In contrast, parcel volumes increased in 2014-15 by 7 per cent[1] as e-commerce generates additional volumes for delivery. There is intense competition between ten larger operators and many small local and regional firms.

Technology drivers in the postal sector

For the purposes of this report, the terms 'technology' and 'innovation' are used broadly to cover devices and products but also their applications and uses. Different basic technologies are an enabler of innovation rather than an innovation in the postal sector in itself. Prime examples of innovative technologies which are already used in today's postal industry are RFID chips (radio-frequency identification chips), sensors, PDAs (personal digital assistants) and also mobile internet and GPS (global positioning system). Cloud computing, big data, the Internet of Things, robotics, drones and 3D printing are among the most prominent technological innovations that will in future play more significant roles in the postal sector.

Driven by competition and customer demand, postal and parcel operators use advanced technology for different purposes, above all to improve operational efficiency and to offer new products and services. In particular, consumer demand for faster

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[1] See Ofcom (2015), Annual monitoring update on the postal market. Financial year 2014-15, 27 November 2015, p. 3.

handling of orders and more convenient delivery is driving change in the sector and technological innovations are enabling e-retailers and postal operators to respond to those requirements.

For example, automated sorting and centralisation of letter and parcel operations are important developments, especially sequencing of letter deliveries to street level, as well as automated scanning. These have both been facilitated by postcode granulation. In the parcels business, last-mile deliveries have been improved with technologies such as PDAs for signature scanning which also have added additional security for consumers.

E-commerce is a key driver for postal services

The internet has transformed society in many ways. About 90 per cent of the British population is now online. People in the more densely populated parts of the country benefit from high-speed broadband networks but there are still gaps in rural areas, such as parts of Scotland and Wales. In parallel, mobile access to the internet is growing fast, especially via Wi-Fi in cities. As a result, internet usage is rising across all age groups, although younger people remain ahead of older citizens in terms of overall time spent online.

High internet penetration has driven the rapid growth of e-commerce in the UK, which is Europe's largest market. The UK has constant double-digit e-commerce growth rates and further strong growth is expected in the years ahead. Britons shop online for all kinds of goods, with groceries as one of the latest trends. Increasing competition in the e-commerce market provides positive incentives for all market players, retailers as well as parcel carriers and lends an additional impetus to the development of new online-shopping and delivery solutions.

Home delivery is clearly the most preferred option for consumers and delivery companies are using technology to introduce new added-value services. But many alternatives also exist and are being expanded to increase customer convenience. The most popular alternative delivery form is 'click and collect', where consumers pick up their online orders at 'parcel shops' or, to a lesser extent, from self-service parcel lockers.

On the supply side, e-commerce is now an established sales channel for British retailers, representing about 20 per cent of revenues.[2] Most online retailers are multi-channel retailers originating in the high street, although there are many 'pure play' online-only retailers, led by Amazon and eBay.

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[2] See Eurostat (2014), Share of enterprises' turnover on e-commerce, see:
    http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tin00110&language=en.

Overall, e-commerce using digital networks has put British consumers in a better position in relation to commerce in the physical world. However, not all consumers will be able to benefit to the same extent. The positive impact of innovations on consumers will only be effective if certain preconditions are fulfilled, ie network access, device ownership and knowledge. As anticipated, the research results show technical requirements such as broadband access are not available in the same quality in remote areas as in urban areas and the necessary equipment like smartphones/tablets or desktop computers are less affordable for low income groups. The use of new innovations requires digital literacy, which is presumably more widespread the younger age group.

Overall demand for postal services

As mentioned above, demand for postal services has been transformed in recent years. Mail volumes peaked in 2004 after a long growth period and have declined since then, albeit somewhat more slowly in the last few years. Consumer demand for transactional mail has dropped substantially due to e-substitution, while direct mail (advertising) volumes have tended to rise and fall in response to general economic trends. Publishing mail volumes have fallen as more communications and media go online, while social mail (ie greeting cards and letters) has also declined significantly.

Parcel volumes in the UK are growing as consumers buy more and more online, generating more orders for delivery. This business to consumer (B2C) volume growth is slightly held back by the digitalisation of some physical goods such as books and music CDs. B2C volumes make up more than half the market compared to business to business (B2B) deliveries which are increasing more slowly, roughly in line with GDP growth.

Innovative technologies enable more efficient postal operations and better services for consumers

As a general trend, technology has helped the parcel delivery chain to become receiver-centralised. Consumers, who act as receivers, are not only better informed about the status of their delivery via tracking, they now also have the option to change the delivery process by redirecting a parcel to a different delivery point, or postpone delivery if they are not at home.

The increasing popularity of these delivery methods means carriers have to turn to a more individual approach instead of a standardised supply chain for delivery of each and every parcel. Consequently, this requires carriers to modernise their processes and to substantially invest in their IT infrastructures as a means of raising their operations' efficiency.

The position of postal operators is under increasing pressure. Global e-retailers might be turning the carrier's core offering, last-mile delivery, into a commodity which lacks added value and is subject to intense competition. By contrast, technology is impacting positively in different parts of the postal sector, mostly in sorting and delivery operations, helping to improve the overall consumer experience. Different kinds of technologies are enabling postal and parcel carriers to make their operations more efficient and create value added services in delivery. This is particularly valid in the parcels business where rising volumes are increasing the need for greater sorting capacity and faster handling processes as well as quality differentiation.

Barcodes speed up parcel sorting as they can be automatically scanned. More carriers are introducing data-rich 2D codes which contain additional information such as routing instructions which enable tracking. These barcodes also enable new value added mail services as the 2D code can carry additional information, such as personalised special offers or discounts that can be redeemed at a local shop.

Other technological advances that speed up sorting include sensors, cameras and area scanners, along with fingerprint technology based on parcel images and software recognition. Radio-frequency identification is a powerful technology that enables even faster remote processing and is used for some express and special logistics products. However, it currently remains too expensive for parcel services that are used by consumers.

Robots have already found their way into parcel sorting operations although at present they are still in a testing phase by companies such as Amazon and DHL. However, with the rapid development of robotics, robots will likely take over more tasks in future.

Self-service parcel lockers offer 24/7 access times and make deliveries more efficient for carriers through avoiding failed delivery attempts. Parcel lockers are being gradually rolled out in Britain by InPost and Amazon but remain relatively few in number compared to the extensive 'low-tech' parcel shop networks operated by various carriers. Home 'parcel boxes' do not yet play a role in the UK. Futuristic concepts such as self-driving vehicles and flying delivery drones remain some way off at present, despite well-publicised tests.

3D printing is an innovative technology that is growing but at present remains a niche business mostly for business purposes such as industrial production or for creative consumers as tests show (Royal Mail, Myminifactory). To a certain extent, this creates additional items to be shipped. The relevance of consumer deliveries is quite limited at present due to high costs, limited choice of production materials and complex operations.

In contrast, shared (crowdsourced) delivery is a fast-growing phenomenon that is spreading from the USA and into the UK. Technology firms operating through apps and

websites sign up consumers to work flexibly as self-employed delivery couriers using their own car or bicycle, with payment usually by the hour or per delivery. Crowdsourced delivery relies on having a large number of couriers available at any time, and is so far mostly used for urgent or same-day deliveries within cities.

It should be noted that many of the potential delivery solutions mentioned above are characterised by a major disparity between urban and rural areas. Most solutions are designed for highly-populated areas, such as click and collect stores, parcel lockers or same-day deliveries. This leaves consumers in thinly-populated rural and remote regions at a disadvantage and/or facing surcharges for some types of delivery services. Consolidated parcel delivery is seen as a potential solution.

There are other technology-based innovations in the postal sector. For example, web-based re-sellers operate portals enabling consumers and SMEs to compare prices and services, and offer prices lower than official rates by consolidating volumes to secure discounts from parcel carriers. This increases market transparency. Meanwhile, in response to public and customer pressure, some operators are making their operations more sustainable and reducing emissions by introducing environmentally-friendly vehicles - although high prices still prevent large-scale rollouts.

The relationship between the innovations highlighted above and their effect on consumers might not be directly a causal one and may contain considerable complexity. However, the results of our research provide some insight into the impact of these innovations on consumers of postal services. To clarify the diffusion and adoption of an innovation in detail, other determining factors such as consumer needs, cost and price trends as well as the overall technological, regulatory and economic development need to be taken into consideration. With this in mind, technological inventions are a necessary but not sufficient condition alone for market changes, but are an important enabler for innovation in the postal sector.

1. Automation in letter and parcel sorting

- *Sector*: Automation in letter and parcel sorting leads to better operational efficiency and cost savings.

- *Consumers*: Automation in letter and parcel sorting adds to improved delivery quality, enables new products and services and cost savings for postal operators that might be passed on to consumers.

2. Extended track and trace for parcels and value-added mail services

- *Sector*: New data-rich 2D barcoding will become a new standard that allows better tracking and tracing. Postal operators can develop new value-added mail services that contain additional information for consumers, such as discounts. Business senders may use value-added letter services to reach new customers. As response rates to digital marketing are low, physical mailings become more

attractive even if costs per letter are higher. This will drive demand for direct mail and value-added letter services in contrast to other physical mail streams. New technologies like RFID and parcel fingerprinting will remain niche applications as they are more costly than barcodes on paper.

- *Consumers*: Consumers will benefit from improved delivery quality and new products and services which are based on extended track and trace, namely predictable delivery and redirected delivery.

3. Predictable delivery and redirected delivery

- *Sector*: Predictable delivery/real-time delivery redirections might become a new standard within the next three years. Competitive advantages for best-in-class companies stimulate innovations in this field. However, high investments in parcel carrier IT infrastructure are needed and it seems likely that these services will come with an additional charge for consumers.

- *Consumers*: Consumers value additional convenience in parcel delivery and their demand for predictable services will increase to avoid failed deliveries. Consumers benefit from improved delivery quality, yet this can require providing more personal data. This could give rise to increased privacy concerns and mean consumers are 'always online' leading to additional potential data security issues.

4. Same-day delivery

- *Sector*: Same-day delivery will probably become a normal service option within three years based on variable pricing. A condition for cost effective same-day delivery is the need for decentralised inventory and regional warehouses.

- *Consumers*: Same-day delivery is an attractive option for urgent wants and needs but the willingness and ability of low income consumer groups to pay premium prices remains unclear. Same-day is likely to stay a niche as there seems to be a stronger demand for 'reliable' deliveries than for 'fast' deliveries. For cost reasons, same-day delivery will not be on offer in remote regions in future and low-income consumer groups will be potentially excluded from the service because of extra charges.

5. Variety of PUDO (pick-up and drop-off) solutions

- *Sector*: Parcel carriers offer a wider choice of alternative 'click and collect' options such as parcel shops and lockers. This is a win-win situation as it allows carriers to realise significant delivery cost savings. New market entrants and more solutions are likely as click and collect options from third parties outside the postal sector emerge.

- *Consumers*: Consumers benefit from the variety, convenience and choice that PUDO solutions can offer. There are potential exclusions or disadvantages for

some consumer groups because many of the solutions will not be rolled out nationwide or, if they are, could imply extra charges.

6. Growth and competition in the parcel market

- *Sector*: Strong competition will intensify because of new entrants and due to e-retailers like Amazon offering their own delivery service. This puts more pressure on carrier margins. Growth and competition in the parcel market is also a driver for new and enhanced services and can lead to competitive pricing. One of the main new developments is the extension of competition in retail to expand the supply chain.

- *Consumers*: Consumers are able to profit from parcel delivery services that are innovative and offer new options that can better reflect their needs. Cost savings based on more efficiency create potential for price reductions for consumers.

7. Shipping platforms (re-sellers) for private consumers

- *Sector*: Shipping platforms increase the number of service options for (online) B2C senders. They generate extra volumes but at the same time increase pricing pressures for those carriers who cooperate with the re-seller and platform operator.

- *Consumers*: Consumers are offered lower prices and more service transparency on shipment platforms. They profit from discount prices which are otherwise only on offer for business customers with sufficient volume. Most shipping platforms focus on small online sellers rather than occasional private senders.

8. Sharing economy (crowdsourced deliveries)

- *Sector*: Crowdsourced deliveries are a new business option for technology-based market entrants. Low-cost flexible business models based on web applications allow these delivery companies to organise delivery in a local area or even nationally. However, legal issues like liability for damaged goods or tax and insurance issues remain unsolved at this stage. The long-term business prospects of the sharing economy in delivery is as uncertain as in other business areas.

- *Consumers*:

  - As part-time delivery workers, consumers are able to generate additional income. Crowdsourced delivery is useful for occasional workers who prefer flexible working times. Legal uncertainties such as employee status and insurance issues have to be solved on a national level.

  - As receivers, solutions based on sharing economy stimulate potential new consumer demand, especially in the field of one-hour or same-day delivery. For point-to-point same-day delivery, crowdsourced options allow lower

delivery prices. There are potential exclusions or disadvantages that could be expected for some consumer groups, so far these options are only evolving in inner city areas.

9. Sustainability

- *Sector*: Today, postal operators make investments in costly 'green' vehicles on a comparably small-scale. Environmental measures to reduce energy usage in buildings, lighting and other outlets are part of many strategies to reduce emissions. The external pressure for stronger measures is rising, and have been expressed in requirements for congestion charges and emission reductions. The environmental policies in place also influence the expansion of CO_2-neutral delivery options.

- *Consumers*: Many consumers feel the need to act in an environmentally-conscious manner and public pressure for more environmentally-friendly deliveries is rising. New delivery concepts could reduce inner city congestion and influence consumers' living conditions in a positive way.

10. Consolidated rural/remote area parcel deliveries

- *Sector*: There are indications of strong potential for single carriers to deliver all parcels in rural or remote areas, such as the Scottish Highlands and Islands, in order to reduce high final-mile costs. However, this requires industry-wide collaboration and above all, IT integration. Competitive and brand issues prevent further collaboration in some cases.

- *Consumers*: Consolidated parcel deliveries to rural and remote areas ensure continued or even better delivery services. This strategy allows stable or even lower prices for consumers in rural areas by reducing delivery costs. This offers a clear scope to give up delivery surcharges for remote areas.

11. E-substitution

- *Sector*: E-substitution, ie increased digitalisation, will further reduce overall physical letter volumes but might also imply growth potential for direct mail due to better response rates. The need for social and legal requirements for continued traditional letter services remains. Financial pressures will rise if e-substitution reaches a critical mass eroding revenues covering shared costs. New mail products and services like individually barcoded letters are developed to meet demand of senders.

- *Consumers*: Consumers will intensify digital usage but at the same time security concerns could rise. Potential digital exclusion and disadvantages for some consumer groups arise, mainly for consumers with less confidence using the internet which could include groups of elderly consumers, consumers with low income who cannot afford digital devices and access to online services, or those

living in areas with low bandwidth. Higher physical mail prices might come up for consumers if letter volume decreases sharply because of e-substitution.

12. Automated (self-driving) vehicles

- *Sector*: Automated, or self-driving vehicles, are currently still in a testing phase. Our findings show a potential future use for long-haul transportation. On the one hand, cost savings are to be expected, and would be achieved through staff reductions, but on the other hand high upfront investments are required. There seems to be little final-mile potential for this innovation due to delivery handover requirements and regulatory and safety issues.

- *Consumers*: Consumers benefit from improved road safety if self-driving vehicles fulfil high standards. We do not expect any impact on last-mile delivery at the moment.

13. Robots in postal logistics

- *Sector*: Robots are increasingly used in parcel sorting and warehouse operations, for example in loading/unloading procedures where they ease the workload for workers. Significant technological improvements are expected in the next few years. Long-term standardisation on a multinational scale is a precondition for successful implementation. Although robots imply cost savings potential high upfront investments prevent smaller parcel operators from pursuing research and development of solutions.

- *Consumers*: Any short-term direct impacts from the use of robots in postal logistics do not seem likely. Long-term potential benefits could occur if cost reductions from their operational use are passed to consumers in the form of price reductions.

14. Delivery by drones

- *Sector*: Parcel delivery by drones is in an experimental phase at present. Many technical issues have to be solved before drones can be implemented as a standard delivery method. We see long-term potential as a niche service, such as urgent deliveries to remote areas, but large-scale usage seems unlikely because of safety regulations, high operational costs (drones have to be steered by trained personnel) and limited carrying capacity.

- *Consumers*: Consumers in rural and remote areas might benefit potentially in the long-term, especially in the field of urgent or deliveries, such as medical supplies. A possible argument against standardised drone delivery routes are unclear delivery handover arrangements.

15. 3D printing

- *Sector*: This niche technology is expected to remain mostly for industrial production due to high costs and limited product choice. The production and selling of 3D objects will have a slight positive volume effect on shipments. There is a theoretical potential to relocate mass production/production of specialised objects to local sites, thus reducing parcel volumes, but major technological improvements and cost reductions would be required within the coming years.

- *Consumers*: Today, 3D printing is a niche alternative for tech-savvy consumers to 'create' their own goods. From our findings we conclude that there is minimal overall impact on consumers as postal services users for the coming years.

Overall impacts on consumers

Overall, the impact of technology on consumers of postal services has clearly been positive to date and will remain so in the years ahead. Technology, primarily through the spread of the internet and mobile devices, has empowered consumers and transformed them from passive to active participants in the postal services market. With the rise of e-commerce, carriers have changed their focus from senders, the business customers, to receivers, the consumers receiving the goods. Carriers have used technology to make their postal operations more efficient and to improve or introduce innovative new products and services. Other new technologies are being tested and many of them will result in further improvements for consumers of postal services.

Generally lower costs expressed through lower prices are good news for consumers, and particularly lower income consumers.

The main general benefits for consumers from technology in the postal sector include:

- better and faster delivery services
- more convenience and choice
- new revenues in parcels as part of revenue pool
- attractive prices, established through competition

There are also new opportunities for vulnerable consumers from the growth of e-commerce because doorstep delivery of all kinds of goods has become standard at no extra charge.

Inevitably, there are various concerns related to the increasing use of technology in postal services - although these mostly result from the absence of technology-based services rather than the technology itself. These include:

- All consumers will have to disclose more personal information in future, potentially putting sensitive data at risk.

- Consumers with low income, limited digital skills and/or no internet access will be excluded from e-commerce benefits found through wider availability of goods, lower prices and convenient delivery services. They are thus at risk to be more impacted by higher mail prices or reduced service quality.

- Consumers in remote areas will have severely limited delivery options and can face a lack of choice, high surcharges or no alternative delivery options.

- Elderly consumers or people with disabilities will rely on delivery to the door and benefit little from 'click and collect' alternatives.

Conclusions and recommendations

This report therefore concludes that technology plays an overall positive role for postal services and acts as an enabler and a driver for better services for consumers. The benefits to date outweigh the risks and concerns. Looking ahead, technology will become more and more important for postal services, and further positive benefits for consumers are expected.