Report for Ofcom

Online data economy value chain

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Contents

Annexes

For any query on this report, please contact David Abecassis, Principal, at david.abecassis@analysysmason.com.

Glossary of terms

ad agency	A company that develops, plans and manages advertising on behalf of advertisers
ad blocking	A practice, typically implementing through tools added on to Internet browsers, that consists in preventing display ads from being shown in a browser window
ad exchange	A technology platform which enables real-time bidding for online advertising space, which can be provided via an *ad network*
AdID	An alternative to cookies reportedly under development by Google, offering increased user control and limiting access to behavioural data to companies approved by Google
ad inventory	Advertising space that is made available to advertisers by a publisher (e.g. of a website)
ad network	A company that matches advertising demand to (usually) aggregated advertising inventory
aggregation	A practice consisting in bringing together different data sets; this can refer to the creation of a new data set from information about several individuals, or from data collected from multiple sources (in which case we also use the term 'combination')
anonymous data	Data which is not attributable to individuals; for example, "60% of people in sample A are male"; *non-personal data* need not be anonymous, it can be *pseudonymous*
app	Short for 'application', typically used in the context of mobile applications accessed through smart devices (phones and tablets)
ARPU	Average revenue per user, usually reported as a monthly figure
audience insights	See *customer insights*
audio-visual sector	In the context of this study, PSBs and pay-TV platforms, including linear TV and video on demand
BARB	Broadcasters Audience Research Board, an organisation formed in partnership with broadcasters that collects data from panels of viewers selected to be representative of the country as a whole
behavioural data	Data regarding activity such as web browsing, TV viewing or the usage of telecoms services, which may be used to infer a customer's needs or preferences
BSS/OSS	Business support system/operational support system, computer systems used by telecoms providers to aid network maintenance and the provisioning and delivery of telecoms services
churn	The movement of a service provider's customers to a competitor; this is often expressed as the percentage of the customer base who leaves within a year

commoditisation	Evolution of the character of a good or service towards becoming a 'commodity', i.e. a good or service that is supplied without significant differentiation in the market. In the context of telecoms, the term is often used to describe the process through which operators are increasingly providing data network capacity rather than the services that make use of this capacity
connected device	An electronic device that is connected to, and exchanges data via, a network, in particular the Internet. Includes PCs, tablets, phones (smart or not), smart TVs, games consoles, etc.
contestability	The ease with which a particular market can be entered by new companies: a highly contestable market is one that has low barriers to the entry of new players, and vice versa
cookie	A small file containing a string of characters, downloaded when visiting a website that typically contains data associated with the use of this particular site by an individual
CPA	Cost per action, the charge to an advertiser per agreed action surrounding their advert; the action may be a click (see *CPC*), a purchase or other behaviour related to that product (e.g. finishing the tutorial for a game)
CPC	Cost per click, the charge to an advertiser per click on their advert
CPM	Cost per thousand impressions, the charge the advertiser pays for every thousand viewers of its ad on a given property
customer data	Any data obtained by a commercial organisation about individuals, who may be customers, consumers, subscribers, viewers, etc.
customer insights	In this report, commercially useful information that has been derived from the combination and analysis of online customer data, identifying groups of individuals based on their characteristics and behaviour
data aggregator	A company that aggregates online or offline customer data (see *aggregation*)
data collector	A company that gathers customer data; it may be a *first party* with a direct relationship with the customer, or a *third party* authorised by the first party
data controller	A term used in the UK Data Protection Act 1998 to designate "the party who determines the purposes for and manner in which (personal) data is processed"; this is typically the entity which collects the data
data management platform	A digital platform that enables data to be stored, analysed, aggregated with other sources and shared / used in activities such as targeted advertising
data processor	A term used in the Data Protection Act 1998 to designate a party other than the *data controller* "who processes [personal] data on behalf of the data controller"; in practice, a third party that is bound by the terms of the agreement between the *data subject* and the *data controller*, and cannot use this data for any other purpose
data subject	An individual whose personal data is collected
de-anonymisation	The cross-referencing of *anonymous* or *pseudonymous data* with other data sources that leads to the identity of the person that the data refers to becoming available
declared data	Data directly provided by an individual, in contrast to *inferred data*

differential privacy	In the context of this report, the ability of an anonymous or pseudonymous dataset to yield accurate insights while being able to withstand efforts to de-anonymise it; see *de-anonymisation*
disintermediation	See *intermediation*
DNT	Do-Not-Track, a proposed addition to web standards which explicitly requests a website to exclude a visitor from tracking mechanism (e.g. via cookies); browser-based implementations are now available
DPR (or GDPR)	(General) Data Protection Regulation, a proposed European legislation intended to unify data protection law within the European Union to simplify the collection and use of customer data by companies operating across European countries
EBITDA	Earnings before interest, taxation, depreciation and amortisation, a common measure of profitability
first party, third party	A first party has a direct relationship with a consumer, and owns either the product, service or website that the consumer uses. A third party may collect data about consumers, but sources this from first parties. In the context of *cookies*, any cookie which belongs to the website from which that cookie is downloaded is considered first party. All others are considered third party cookies
geo-fencing	The targeting of consumers (e.g. with ads) based on their location; typically involves defining ('fencing') specific areas and addressing specific messages to customers who are located in these areas
HTML5	A markup language used to structure and display multimedia content on the Internet
ICO	Information Commissioner's Office – the UK's data regulator
inferred data	Data that can be deduced through the analysis of *declared data*
infomediary	An *intermediary* whose role in the value chain is the exchange or processing of data, typically on behalf of other market participants
intermediary	A company that carries out functions in the value chain between two parties (e.g. between a publisher and an advertiser)
intermediation, disintermediation	Intermediation is the inclusion of an external party fulfilling a role between two companies; disintermediation is the removal of this external party with the role instead being fulfilled by one of the two companies
IP address	An identifier that enables communications over the Internet. The IP address that is visible outside the local network is often attributed and reset dynamically by the ISP on a regular basis (dynamic IP address). An IP address that is not dynamic is called a static IP address
JavaScript	A computer programming language, commonly used to write software applications that run inside web browsers
linear advertising	Advertising that is delivered according to a predetermined schedule via *linear TV*
linear TV	TV programming that is broadcast according to a schedule set by the broadcaster, delivered via terrestrial, satellite, cable or IP technology. Linear TV is contrasted with on-demand or over-the-top services – see *OTT*

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micro-segmentation	The precise identification of divisions (segments) of a market containing a small number of individuals, based on characteristics such as age, gender, income or behaviour
monetisation	The process of deriving revenue from an activity or an asset
non-personal data	Data that cannot be used to identify an individual, either on its own or together with other data that may be in the possession of the same *data controller*
online customer data	*Customer data* that has been collected online or by the network systems used by telecoms operators
online sector	Internet-based companies, including mobile app developers
OSS	Operational support system – see *BSS/OSS*
OTT	Over the top, used to categorised services (e.g. the delivery of digital content) through the Internet
personal data	Data that can be used to identify an individual, either on its own or together with other data that may be in the possession of the same data controller
pixel tracking	A technique consisting in a server uploading a 1×1 pixel GIF image to a visitor's browser; this 'tracking pixel' is placed on a web page or within an email so that, when the page or email is viewed it enables the server to track page-viewing behaviour
pre-roll, mid-roll, post-roll	Refers to ads shown before, during or after an audio-visual programme
programmatic advertising	The automated delivery of online advertising, typically through real-time bidding systems and making use of customer insights; see also *ad exchange*
properties	In the context of this report, refers to websites and applications in which advertising can be inserted
pseudonymous data	Data in which personal identifiers (personal data) are replaced with artificial identifiers; the data retains its raw structure so that individual profiles retain their accuracy and may be cross-referenced with other data sets (pseudonymised in the same way), however the individual cannot be identified; see also *differential privacy*
PSB	Public service broadcaster, a broadcaster who is required to broadcast a wide range of content intended for public benefit rather than for purely commercial reasons; used in this report specifically in the UK context to designate the BBC, as well as Channel 4 and ITV (the latter two being referred to as 'the commercial PSBs')
retargeting	Advertising for a product shown specifically to a consumer who has previously expressed interest in, or intent to purchase that product (e.g. by viewing certain web pages)
SAC	Subscriber acquisition cost, the cost of adding a customer for a company such as an operator, which can include sales commissions or subsidies
second-screen app	An *app* intended to be used on a mobile device at the same time as using another, larger screen, for example for watching TV or playing games
SRC	Subscriber retention cost, the spend by a company to retain existing customers, in the form of incentives and promotions
targeted	Advertising delivered to a particular audience segment or individual based

advertising	on information available or inferred about the segment or individual in question
technical data	In the context of this report, data which identifies the type of technology used by a customer, including both hardware and software
third party	See *first party*
traffic management	A generic term for techniques used by ISPs to optimise the use and availability of network resources
transaction data	Data which relates to the purchase of goods, including for example the item purchased, method of payment and purchase price
triple-play operator	An operator which provides three services together in a bundle, typically Internet access, TV and telephony services
Web publisher	The publisher of content on a given Internet *property*, and therefore the owner of the *advertising inventory* available on that property

0 Executive Summary

Throughout the UK, citizens and consumers are using online services, accessed through connected devices, for an ever wider range of daily activities. The UK is, for example, the largest e-commerce market in the European Union;[1] it is home to three of the world's most-visited online news websites (the Daily Mail, The Guardian and BBC News);[2] and it is a pioneer in connected TV and online TV viewing.[3]

In consuming and interacting online, people routinely provide information about themselves, by registering for a service, making online purchases or simply interacting with webpages. They do so through fixed and mobile broadband networks; the operators of these networks have a commercial relationship with and therefore information about these users.

This vast amount of information is commercially valuable and is enabling the emergence of new business models linked to the collection, storage, combination and analysis of online customer data. Opportunities are emerging for new types of market players, notably specialist companies (so-called *intermediaries*) that fulfil a varied range of roles, from increasing the efficiency of online advertising to generating and selling specific insights derived from this data.

The gathering, storage, processing, and exchange of information are sensitive, because they can raise questions for citizens and consumers about how data relating to them is used and who can access it. As a result, the protection of customer data and related privacy issues are a prominent source of international policy discussions.[4]

Technological and commercial innovation in the use of customer data is increasingly of interest to stakeholders in sectors that Ofcom regulates. One of Ofcom's regulatory principles is "to research markets constantly and […] to remain at the forefront of technological understanding". In parallel, Ofcom has a statutory duty to further the interests of UK citizens and consumers in relation to communications matters and markets.

Ofcom commissioned Analysys Mason to prepare an independent report examining the role of online customer data, and its impact on five sectors: the online, audio-visual,[5] fixed and mobile

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[1] See for example Ofcom, *The International Communications Market 2013*, Section 1.4

[2] See for example statistics from Alexa

[3] *Ibid.*, Section 1.6

[4] See for example the Digital Agenda for Europe (e.g. http://ec.europa.eu/digital-agenda/en/online-privacy, http://ec.europa.eu/digital-agenda/en/eprivacy-directive-data-breach-notifications), and the FTC's work on protecting consumer privacy, particularly in the online context (http://www.ftc.gov/news-events/press-releases/2012/03/ftc-issues-final-commission-report-protecting-consumer-privacy)

[5] Defined for the purpose of this study as primarily the public-sector broadcasters and pay-TV companies. The services considered are audio-visual media, including linear TV and video-on-demand.

telecommunications, and postal sectors. The insights in this report were developed through a combination of secondary research and interviews with stakeholders across these sectors.

The importance of online customer data in these five sectors varies considerably. However, some important similarities are emerging as more and more services become Internet-based. These similarities relate to the types of uses of customer data, the relative attractiveness of these different uses and the requirement to maintain customers' trust that their data and privacy will be protected.

Across sectors, the uses of online customer data can be broadly classified in three categories:

- supporting advertising and promotion of product and services
- enabling improvements to the quality of existing services, or to their profitability
- allowing the development of new products and services that rely on customer data.

In all cases, customer data is used to improve services: it supports advertising by helping to match advertisers with audiences; it helps to improve marketing efforts by identifying customers' needs so that they can be better addressed; and it feeds into the development of personalised services that can deliver a better experience to customers. Accordingly, across the online, audio-visual and telecoms sectors, the availability of customer data and the ability of companies to analyse and use it in relevant ways are making customer data an important strategic asset and a focus for investment. This, in turn, is stimulating the emergence of specialist intermediaries that are able to use sophisticated methods to combine and analyse data from various sources and provide improved insights to their clients.

Our research indicates that the sale of these customer insights[6] is not currently a significant business model in revenue terms, but our interviews suggest that it will become increasingly important.

Beyond these similarities, some important differences remain between the sectors regarding what data is collected, how it is used and the reliance of various market players on such data.

Online sector – The use of customer data is enabling online features that are facilitating a shift in spending (by consumers and advertisers) from bricks-and-mortar based business models to online models. For example, the targeting of ads based on the specific characteristics and behaviour of customers is increasing the value of certain types of online advertising, which in turn is driving some of the growth in online advertising spend at the expense of traditional display advertising. Likewise, the ability to *retarget* online users that have already shown an interest in a product is helping to increase the sales of e-commerce websites. In the future, it is likely that the use of customer data will continue to become more prevalent, as online use continues to grow, both for online advertising but also increasingly to tailor and personalise services to individual users.

Audio-visual sector – The progressive shift of viewing habits away from linear TV towards online TV and video-on-demand is viewed by some industry stakeholders as threatening the

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[6]   By customer insights we mean information derived from the combination and analysis of customer data.

traditional business models of some established players. In particular, the commercial public service broadcasters (ITV and Channel 4) have until now been able to sell advertising space (in the form of slots before, during and after programmes) as part of a package which enables advertisers to loosely target customers. The rise in the online consumption of TV and the increased sophistication and maturity of online advertising may be a threat to this model, as broadcasters will be asked by advertisers for the ability to target *specific* groups of viewers as effectively as other online video delivery platforms. This creates a risk that intermediaries will in future be better positioned to offer these ad-targeting services to advertisers, and therefore will capture some of the broadcasters' revenues (by providing the added value). In addition, the ability to tailor the marketing and delivery of video content to online audiences may become more valuable as more personal consumption using online services grows at the expense of traditional TV viewing.

Fixed and mobile telecoms sectors – Advances in IT systems are enabling operators to store and analyse the vast amounts of data they collect as part of their everyday network operations. The uses of this data and the insights that can be derived from it are still being explored. Operators are, for example, using *micro-segmentation* based on the analysis of large sets of customers' characteristics to help serve customers more individually and tailor products accordingly. Operators are also improving the quality of experience they offer by using network management techniques relying on the real-time analysis of usage and network data. Overall, customer data appears to be most valuable in helping operators to compete with one another, in two main ways. Firstly, advances in marketing techniques such as micro-segmentation allow operators to design and target products and promotions to small groups of users, instead of offering a small number of standardised products to everyone. Secondly, a better understanding of customers' usage behaviour can also help manage network utilisation and therefore quality of service better. In the future, new models may emerge that enable operators to generate new revenues from customer data, but so far there are few successful examples.

Postal sector – So far, the use of online data by postal operators remains limited compared to offline information such as that held in the Postcode Address File (a national database containing address details for 29 million properties). Some operators are experimenting with online customer data: for example, Royal Mail has partnered with external companies such as eBay to combine its address database with demographic or commercial data, leading to new insights linking addresses to information on people who live in a given postcode area. Despite these experiments, there is no clear evidence of major interest in online customer data from postal operators.

In relation to privacy, most market players across all the sectors are keenly aware of concerns surrounding privacy and data protection. All interviewees are keen to depict their businesses as focused on maintaining the trust of customers, and have argued that this is often a more stringent constraint than regulation, notably in support of their preference for self-regulation.

As technology and business practices surrounding the use of customer data continue to mature, it is likely that its use will become ever more widespread. New business models will emerge, making innovative use of existing customer data or defining new ways to collect data. In this context,

regulators and policy-makers must continue to strike a balance between enabling innovation and protecting consumers.

It is important to note that for these regimes to be and remain effective, consumers must have access to the appropriate information on which to make decisions about how their data is collected and used. They should also be provided with the right tools to be able to make these choices without being excluded from services altogether.

1 Introduction

1.1 Context and scope of this study

Throughout the UK, citizens and consumers are using online services, accessed through connected devices, for an ever wider range of daily activities. The UK is, for example, the largest e-commerce market in the European Union;[7] it is home to three of the world's largest online news websites (the Daily Mail, The Guardian and BBC News); and it is a pioneer in connected TV and online TV viewing.[8]

In consuming and interacting online, people routinely provide information about themselves, by registering for a service, making online purchases or simply interacting with webpages. They do so through fixed and mobile broadband networks; the operators of these networks have a commercial relationship with these users and can therefore collect information about them.

This vast amount of information is commercially valuable and is enabling the emergence of new business models linked to the collection, storage, combination and analysis of online customer data. Opportunities are emerging for new types of market players, notably specialist companies (so-called *intermediaries*) that fulfil a varied range of roles, from increasing the efficiency of online advertising to generating and selling specific insights derived from this data.

The gathering, storage, processing, and exchange of information is sensitive, because it can raise questions for citizens and consumers about how data relating to them is used and who can access it. As a result, the protection of customer data and related privacy issues are a prominent source of international policy discussions.

Technological and commercial innovation in the use of customer data is increasingly of interest to stakeholders in sectors that Ofcom regulates. One of Ofcom's regulatory principles is "to research markets constantly and […] to remain at the forefront of technological understanding". In parallel, Ofcom has a statutory duty to further the interests of UK citizens and consumers in relation to communications matters and markets.

In this context, Analysys Mason was commissioned by Ofcom to prepare an independent report examining the role of online customer data, in the following five sectors: the online, audio-visual,[9] fixed and mobile telecommunications, and postal sectors. The insights in this report were developed through a combination of secondary research and interviews with stakeholders across the five sectors.

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[7]   See for example Ofcom, *The International Communications Market 2013*, Section 1.4

[8]   *Ibid.*, Section 1.6

[9]   Defined for the purpose of this study as primarily the public-sector broadcasters and pay-TV companies. The services considered are audio-visual media, including linear TV and video-on-demand.

In this report we have focused on describing in detail the principal ways in which online customer data is used in these sectors, how it is contributing to growth, and what factors may support or hinder the further development of customer-data business models. Our study has four main objectives:

- Determining the nature and importance of the online data market in the UK.

- Understanding the broad structure of this market, and the roles that core participants play in the value chain.

- Identifying the main drivers for the future growth of this market, and assessing potential barriers to that growth as well as actions that could be undertaken to stimulate greater or faster growth.

- Providing Ofcom with a scenario-based, forward-looking outlook highlighting the key questions for policy-makers.

For the avoidance of doubt, the scope of this study is limited to online customer data in the five sectors mentioned above. Customer data is used extensively in many other sectors of the economy (e.g. healthcare, transportation) which are not considered in our report. Furthermore, data-driven business models make use of a wide variety of data, a large part of which is not *customer* data (for example, real-time stock data which is used to optimise supply and delivery). Finally, our focus is on the *economic* impact of the use of customer data; we have given some consideration to social aspects, including the right to privacy and the protection of personal data, but only to the extent that they may conflict with future developments related to business models. It should be noted that this report does not address these highly complex considerations in detail.

1.2 Defining online customer data and related concepts

Customer data has always been a feature of commerce and finance, and underpins simple activities such as deliveries and more complex ones such as insurance pricing. With the increasing use of connected devices and services, the amount of information that users generate is increasing rapidly while, in parallel, technological advances are enabling companies to take advantage of this data. In particular, the availability of cheap data storage, ever greater processing power and broadband connectivity reaching out to almost all households and businesses enables companies to collect and analyse vast amounts of data, ultimately to the benefit of their business.

Types of online customer data

In this report, we use *customer data* as a generic term to refer to any data obtained by a commercial organisation about individuals, who may be customers, consumers, subscribers, viewers, etc.[10]

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[10] 'Customer' implies that a commercial transaction is taking or has taken place, whereas consumer is a more generic term implying that a commercial transaction could potentially take place. In some expressions such as 'consumer

The term *online customer data* covers a vast range of types of data, such as *identity* data (name, address, gender, age, etc.), *behavioural* data (navigation through the web, online transactions, mobile and fixed telecoms usage, etc.) and *technical* data (type of mobile device, operating system, browser, but also IP address, location within a fixed or mobile network, etc.).

These examples are not exhaustive, and data can fall into multiple, overlapping categories. For example, behavioural data can be considered to include *transaction* data such as payment method, bank account details, card details, product details and amount spent – some of which consumers may view as private. Likewise, behavioural data may include *operational* data that is essential to the operation of networks and online platforms, and is therefore to some extent technical in nature. This data includes, for example, what content someone has watched online and the movements made by their mouse cursor while browsing.

Data collection mechanisms

Thanks to technological advances, more and more of the customer data generated online can be collected and stored. The mechanisms through which data is generated and collected vary greatly, and companies use a range of different and overlapping methods to collect online (and offline) data. Identity and transaction data is collected using contracts, surveys, competitions and other methods that an individual has to agree to in order to receive a service or benefit, online or offline. Behavioural and technical data is collected in the background by methods such as cookies, and by network-based operational support systems that monitor the performance and usage of networks and services.

Certain types of data, particularly those related to a person's identity or transaction data, are typically collected through a form of explicit *declaration* by the customer. Declared data is something that a customer shares, either voluntarily or because sharing this data is a requirement to use a particular service. A common requirement online and for telecoms services is registration, which is an important source of identity-related data.[11] Data is sometimes collected in a way that does not involve explicit declaration, for example when customers navigate around a website, or type into text boxes. This remains a form of declaration, although customers are likely to be less aware of this compared to when they fill in forms.

Other type of customer data can be *inferred* indirectly from declared data and behaviour; for example, web viewing habits can provide a good indicator of the age and gender of a person.

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protection', the term 'consumer' is used broadly to cover customers as well as, more generally, citizens that may decide to consume certain products.

[11] Some online services require a user to register before they use them; others, such as Channel 4's 4oD online service offer certain features to all users (7-day catch-up) and others only to registered users (30-day catch-up).

Processing and using online customer data

Customer data collected online effectively becomes the property of the party that is authorised to collect it, sometimes called the *data controller*. Other parties may be asked by data controllers to process data on their behalf, for example storing it, aggregating it, combining it with data from other sources, or analysing and enriching it in various ways.[12]

In using any form of customer data, all companies and organisations are bound by laws and regulations that take a fundamentally different approach to *personal* data on the one hand, and *non-personal* data on the other hand.[13] *Personal* data (or *personally identifiable information*, PII) is data that can be linked to a specific identified individual, either on the basis of the data itself, or when that data is combined with other information likely to be in the possession (now or in the future) of the data controller. This definition can sometimes be ambiguous and a matter of judgement; for example, there is no clear consensus on whether an IP address or location data constitute personal data. Broadly speaking, personal data must be adequately protected and can only be collected, used or transferred in ways that the data subject consents to.

Other types of data, including anonymous and pseudonymous[14] data, can be used and transferred between parties more freely, including for purposes other than those for which it was collected. Although sharing non-personal data does not require consent, market participants need to be careful when sharing data: a single piece of data in isolation may not identify a person, but could be used in combination with other non-personal data to identify a person.[15]

1.3 A simplified model of the customer-data value chain

Our analysis suggests that the following activities are involved in all of the business models that make use of online customer data:

- Data collection is the starting point of the value chain. Companies that collect data can either be a *first party*, which has a direct relationship with the customer and owns the product, service, content, website that it delivers to them, or a *third party*, which may collect customer data through the first party.

- Data storage and aggregation is the next stage in the value chain, and involves data collectors investing in storage facilities, leasing shared storage capacity or outsourcing the management of the data entirely, including its storage, to specialised intermediaries. Once the data is stored,

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[12] These parties may be referred to as *data processors*.

[13] In particular the *Data Protection Act, 1998*, available at http://www.legislation.gov.uk/ukpga/1998/29/contents.

[14] Pseudonymous data is defined as data related to an individual who cannot be identified on the basis of this data; it is useful as it makes it possible to correlate data generated by one individual in a sample, without being considered personal data.

[15] This is somewhat dependent on context: with very small sample sizes, it may be that certain non-personal information could lead to a person being identified; for the purpose of this report we have considered a context where large samples are being analysed, consistent with the large sectors we are reviewing.

it can be easily aggregated or combined with data from other online or offline sources. The combined data can either be used or sold on to other parties, typically in an anonymised form.

- Data processing and analysis is the third stage. It involves applying analytical techniques to raw data in order to gain a better understanding of customers. In most cases, data processing and analysis involves understanding patterns of behaviours and correlations. As an example, this may involve creating customer segments which share specific attributes, such as demographic, location, status and behavioural characteristics. Such customer insights can more easily be exchanged and sold as they tend not to include any personal data.

- Use and monetisation of data is the final step, taking the results of the data analysis to improve existing business models or create new ones. As explained below in more detail, the use of customer data can be grouped broadly into three models: *advertising and promotion* (gaining new customers or selling more to existing ones); *margin and quality improvement* (including cost savings); and *product and service development* (innovation).

In summary, once customer data has been collected, it is then stored, and may be aggregated with other datasets. The data may be analysed to allow identification of trends and then distributed to interested market players. Finally, these companies may use the analysed data to create a new revenue stream or enhance an existing one, thus monetising the data to its full potential in the value chain.

These activities are mostly commercial; the data is bought and sold, in accordance with the terms of use agreed by the customer. However, the flows of funds are sometimes more complex, because of the existence of specialised intermediaries that carry out specialised tasks such as storage, aggregation and analysis. These are sometimes referred to as *infomediaries*, and tend to provide services on behalf of data controllers, rather than collect or purchase data themselves. This is illustrated in in Figure 1.1 below.

Figure 1.1: Simplified value chain for online customer data [Source: Analysys Mason, 2014]
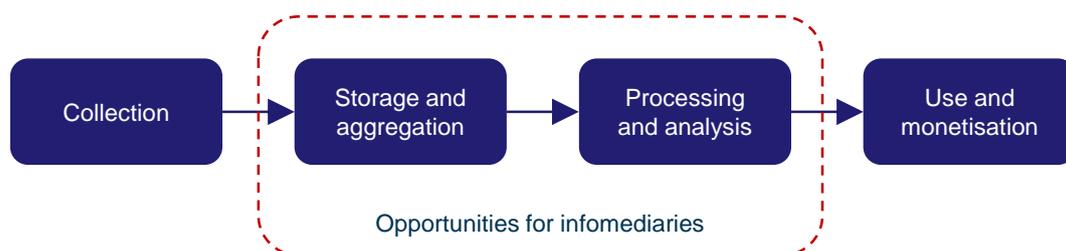
1.4 Importance of online customer data for the five sectors

The importance of online customer data in these five sectors varies considerably. For online publishers and intermediaries it is an important source of revenue. For both fixed and mobile telecoms operators it is an attractive source of competitive advantage, as well as a potential (but unproven) source of future growth. The audio-visual and postal sectors make extensive use of *offline* customer data (e.g. information from viewer panels, postcode data), but so far have shown limited interest in online data. However, as the consumption of online TV increases, it is likely that online data will become more important for the audio-visual sector.

Despite these differences between sectors, we have found that the uses of customer data can be broadly classified into three categories:

- Advertising and promotion – Companies may use customer data to advertise or promote their own products and services. Alternatively, they may use that data to advertise other companies' products, or sell either that data (typically in an aggregated and anonymised form) or analysis based on it to other companies for the purpose of advertising and promoting their own services.

- Margin and quality improvement – Companies across all sectors increasingly use customer data to understand how to improve the quality of a product, or gain cost savings in order to improve their margins.

- Product and service development – thanks to advances in data processing and analysis, companies can increasingly use customer data as an input in the development of innovative new products and services. Unlike the previous two categories of use, which may enhance existing revenue streams by making existing products more attractive, product and service development can create entirely new revenue streams.

In practice each sector is unique in how customer data is collected, processed and used, as well as its use of intermediaries. How each sector uses data depends on its core business, level of maturity, and the extent to which it depends on the Internet:

- Much of the online sector is funded by advertising. Because of the extremely large amount of advertising space (*inventory*) available online, and the low traffic on the vast majority of sites, targeting based on customer data is particularly important in the online advertising market. Targeting and *retargeting* (targeting online users based on an interest they have previously expressed in a product)[16] also help e-commerce websites to convert interest by visitors into sales in a cost-effective manner.

- In the audio-visual sector a large part of content production is likewise funded by advertising revenues. Advertisers and broadcasters have used customer data for a long time to identify and value audiences, albeit data derived from panels and samples as opposed to online data.

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[16] Retargeting is very noticeable: having searched for a product in an e-commerce site you will then be offered advertising for that product when viewing other websites (e.g. news or social media sites)

Broadcasters are developing their ability to handle larger volumes of online data, stimulated by the growth in online audiences (where the advertising value chain has many more intermediaries than in traditional linear TV), and by the increasing ability of devices and platforms (e.g. set-top boxes, smart TVs) to act as intermediaries in the sale and delivery of linear advertising, by dynamically inserting ads into content being viewed by the user.

- Fixed and mobile telecoms operators increasingly analyse and use their customer data to improve their operations and margins. It is far less common for operators to monetise customer data by using it to sell ad inventory, or indeed to resell it in any form (e.g. as customer insights derived from this data).

- Postal operators are still primarily concerned with offline data. However, specific initiatives (such as the Insight Tool developed jointly by Royal Mail and eBay) seek to merge online and offline data to improve logistics and the understanding of customers.

The main uses of online customer data, and the business models they support in these sectors, are described in more detail in the following sections of the report.

1.5 Structure of this report

The following four sections describe the uses of customer data by the online sector (Section 2), audio-visual sector (Section 3), fixed and mobile telecoms sectors (Section 4) and postal sector (Section 5). In each case, we present an overview of the customer-data value chain within the sector, describe the business models being used to monetise the data, and outline the prospects for growth and potential barriers. Following this detailed discussion, Section 6 presents the policy-related findings and trends that are common across the five sectors. We then assess possible scenarios for the future use of online customer data, before providing our overall conclusions.

In order to keep the main body of the report reasonably succinct, much of the supporting detail is provided in annexes. These are referenced where relevant, so the reader may obtain more information on areas of particular interest.

2 Use of customer data by the online sector

Customer data is a core asset in many online revenue models

The Internet is supporting an increasingly large number of business models, including the sale and delivery of digital content, advertising and promotion, and the sale of physical goods and services through e-commerce. Customer data[17] supports all of these in varying degrees, through four core business models: targeted advertising; retargeting of customers that have expressed a prior interest in specific content, goods or services; personalisation of services and recommendations; and the exchange of data that supports all of these.

- Targeted advertising uses customer data to increase the value of online advertising space. This makes it easier for online publishers to sell such advertising space and at a higher price than they otherwise could, and now represents a fundamental part of the online display advertising market. We estimate that in the UK, targeted advertising could account for up to GBP500 million in annual revenues for online publishers, out of total online advertising revenues in excess of GBP6 billion in 2013.[18]

- Retargeting is advertising targeted at customers who have previously expressed an interest in purchasing a specific good or service, and its objective is to convert this interest into a sale. It is difficult to quantify exactly how much retargeting is worth, but its relevance is in encouraging customers to purchase more online rather than offline.

- Personalisation and recommendations likewise play an important role in shifting transactions from offline to online platforms and shops. When applied to e-commerce, recommendations can drive more transactions online as well as increase the average size of each transaction. When applied to content such as articles, music or video content, personalisation and recommendations increase the engagement of customers with these services, which helps to build customer loyalty as well as increase sales and advertising revenue.

- A wide range of specialised intermediaries have developed in support of these business models. Some help online publishers and e-commerce retailers to collect data, store it or analyse it to understand their customers better. Others focus on combining and aggregating data from multiple sources, buying and selling suitably anonymised data so as to build larger data sets, from which new insights can be derived.

Looking ahead to future developments, it appears from our research and interviews that the use of customer data by the online sector will continue to grow strongly as new techniques develop and more and more data is collected and analysed. The regulatory and legal regimes in the UK, as in

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[17]   As explained in Section 1.2, we use 'customer data' to refer to any data obtained by a commercial organisation about individuals, who may be customers, consumers, subscribers, online users, viewers, etc.

[18]   http://www.iabuk.net/research/digital-adspend

much of the world, are conducive to such growth, and at the same time are designed to provide safeguards so that personal data remains well protected. From the perspective of all of the industry stakeholders in this sector whom we have interviewed, the current level of legal and regulatory protection is not overly restrictive, and they claim it is often superseded by the need to maintain customers' trust that their data is being adequately handled and protected.

2.1 Overview of the value chain in the online sector

The online sector relies on data collected about customers as an important driver of revenue from advertising and e-commerce. Customer data is collected from most people who visit websites and use online applications, including mobile apps.

This data can be collected from multiple online sources, combined and analysed to provide information about customers, including lifestyle habits (social, generational, hobbies), demographic characteristics (gender, age, location, home ownership), intent to purchase goods or services (for example whether a customer is looking to buy a holiday, an electronic gadget or insurance). In some cases online customer data is combined with offline data in order to develop more granular profiles about customers, in order to deliver better targeted ads and personalised services.

The online customer-data value chain is rich and complex and contains a wide range of companies that often play multiple roles. These include a range of intermediaries.[19] The various roles in the value chain fall broadly within three categories:

- **Publishers**, whose content and applications support the display of ads and attract web traffic. This category is understood in the online sector to include a wide variety of market participants such as traditional content-focused publishers (e.g. newspapers, bloggers), search engines, mobile apps publishers and e-commerce providers.

- **Advertising intermediaries**, which include *ad agencies*, *ad exchanges* and *ad networks*.[20]

- **Data intermediaries (infomediaries)**, which include a wide range of market participants such as data management platforms and data aggregators, among others.

We have considered the vast majority of mobile apps as part of this sector. Exceptions are typically limited to apps published by broadcasters, pay-TV operators or telecoms operators.

Infomediaries help other parties such as publishers, e-commerce websites and advertisers to collect, store, aggregate, combine and analyse customer data, with a view to increasing their revenues or improving the efficiency of their businesses, for example through better targeting of

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[19] Please refer to Annex B for a schematic illustration of the value chain and a discussion of the types of data market participants collect.

[20] Ad agency – a company that develops, plans and manages advertising on behalf of advertisers.
Ad exchange – a company that operates a platform which enables the real-time bidding on advertising space.
Ad network – a company that matches advertising demand to (usually) aggregated advertising inventory

advertising or tailoring of services. In effect, infomediaries help manage customer data and make sense of it through analytical techniques, for example identifying potential customers for products and services, while advertising intermediaries help advertisers and publishers to buy and sell ad space, as well as deliver ads, on the basis of the type of customer they want to target.

The variety of customer-data business models used in the online sector, and the pace of innovation, are such that it is beyond the scope of this study to examine all of these models individually. Instead, we have considered four of the most common business models in detail:

- targeted advertising
- retargeting
- recommendations and personalisation for direct marketing
- data intermediation and sale of customer insights.

We recognise that specific companies active in the online space use customer data in slightly different ways, but we believe that all the major approaches can be described as combinations of these four models.

2.2 Business models in the online sector that rely on customer data

2.2.1 Targeted advertising

A significant proportion of the revenues of online publishers stems from the sale of advertising space (or *inventory*) on their homepage and other prominent webpages able to attract significant traffic.[21] This type of advertising space commands a premium, and is attractive for brands as a medium to run campaigns whose objective is to show ads on a regular basis to as wide an audience as possible.

The most popular publishers have little problem selling such premium advertising space, but less well visited webpages are less attractive to advertisers for broad-based campaigns. In order to increase the value of non-premium advertising space, publishers may provide information to advertisers about individual customers that visit a given page. This in turn enables advertisers to target their ads to specific groups of customers, whom they see as most likely to respond to the ads. In targeting ads in this way, publishers and advertisers make extensive use of intermediaries, some of which provide technology solutions to match advertisers and publishers, while others improve the information that the publisher can provide about customers through analysis of data and combination with other data from third-party sources.

Improved ad targeting is viewed by many advertisers as an important factor in improving the efficiency and effectiveness of advertising spend: for example, interviews carried out as part of

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[21] For example, the vast majority of the Guardian Media Group digital revenue (over 25% of total revenue in FY2013), are related to various forms of online advertising; likewise, advertising is Reddit's primary revenue driver (see for example http://www.reddit.com/r/TheoryOfReddit/comments/1ihwy8/ratheism_and_rpolitics_removed_from_default/cb4pk6g)

this study suggest that only about 30% of the online ad spend of a fast-moving consumer goods (FMCG) retailer may reach its intended audience. To achieve better targeting, customer data is used by advertisers, publishers and intermediaries to define and identify an online audience that may be interested in specific ads. This can be based on a wide range of attributes including the consumers' interests, demographics and purchasing intent.

Many publishers and advertisers use targeted advertising, and are supported by larger infomediaries such as BlueKai and Acxiom, as well as smaller companies such as Core Audience and Turn. UK-based infomediaries that are involved in targeted advertising include Adbrain, Adfonic, Odyssey Mobile Interaction, Struq and Verticly. The targeted advertising business model is highly fragmented: there are many data infomediaries and advertising intermediaries that perform roles such as collecting, storing, combining, aggregating and analysing customer data, as well as brokering the sale of online advertising space. Some large companies operate across the entire value chain and perform a wide range of roles.

Based on interviews with industry stakeholders and desk research, we understand that infomediaries that help advertisers to deliver targeted ads can retain 20%–50% of the advertisers' spend on these ads, with the rest being passed on to publishers.

Advertisers pay for targeted ads based on two broad charging models: *cost-per-thousand* (CPM) or *cost-per-action* (CPA). CPM simply links the advertising charge with the number of times a given ad is shown (the number of *impressions*) on a given webpage or app. The limitation of CPM is that although the advertiser knows the ad has been displayed, there is no evidence that the targeted customer has actually looked at it or will act on it. CPA provides a mechanism to link specific actions by the user to payment. *Cost-per-click* (CPC) is the most common form of CPA and involves a payment associated with a customer clicking on an ad on a webpage. In the mobile app advertising market, more sophisticated forms of CPA are emerging: for example, an app publisher can advertise its app and only pay when a customer downloads the app.

CPA and CPC are popular with advertisers because they provide a better understanding of the performance of their ads. The attractiveness of CPA is creating opportunities for intermediaries: they may, for example, buy advertising space on a CPM basis and then sell this to advertisers on a CPC basis.[22] The rates that advertisers pay for targeted ads depends on the availability and profile of the particular advertising space being sold, as well as the perceived value of the customers they are trying to target.

Driven by demand from advertisers, improvements to technology and attractive pricing models, targeted advertising has experienced significant growth. We estimate that in 2013, targeted advertising (including retargeting, discussed below) was worth around GBP500 million in revenue

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[22]   http://www.iabuk.net/resources/jargon-buster

for publishers and intermediaries in the UK.[23] Non-targeted display advertising still accounts for the majority of display ad spend, by our estimates around GBP950 million in 2013.

Figure 2.1 below shows online ad spend in the UK between 2010 and 2013, and illustrates the growth in display advertising, alongside paid-for search.

Figure 2.1: Online ad spend in the UK, H1 2010 to H1 2013 [Source: IAB][24]
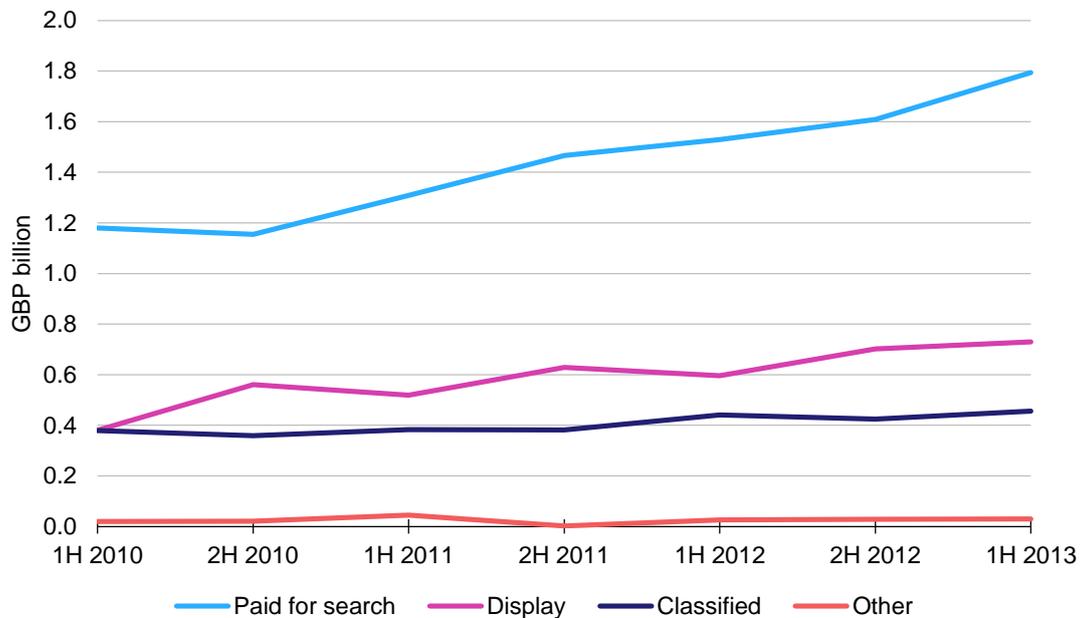
Although we expect targeted advertising to continue growing as a proportion of online display ad spend, this growth will be constrained by the continued attractiveness of premium advertising space for large campaigns, which are by nature non-targeted. These will continue to support brand-building and major product launches, and benefit more from reaching large audiences on popular webpages rather than from customer targeting.

Please see Annex B for a wider discussion of this business model, including details of the value chain and its participants, the flows of data and funds, and the importance of customer data to this model.

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[23]   We expect that 30%–45% of all online display advertising may be targeted or retargeted, based on the fact that display advertising accounted for 24% (GBP720 million) of online display advertising in H1 2013 (Source: http://www.iabuk.net/research/digital-adspend). Please see Annex B for further details.

[24]   http://www.iabuk.net/research/digital-adspend

Case study 2.1: PulsePoint[25]

PulsePoint provides a range of products that aim to help online publishers increase their advertising revenue. It also helps ad agencies to develop targeted ad campaigns via display, video, mobile and social media channels. The company's main product is an ad exchange, which aims at increasing the CPM that publishers can get for their advertising space. It does this by analysing first-party data from publishers, and third-party behavioural and demographic data from Turn, DataXu, Xa.net, Criteo and X+1. It then segments its clients' ad inventories using 40 customer attributes and 350 content types, including both endemic[26] and non-endemic advertising.

PulsePoint also operates a platform that matches publishers and advertisers. This platform enables advertisers and agencies to bid in real time for advertising space, on a CPM basis. PulsePoint's commercial proposition relies on its ability to attract a sufficient number of advertisers or agencies to its platform, competing with one another to get access to attractive advertising space. Through this competitive mechanism, the company is able to generate attractive CPMs for publishers, who therefore have an incentive to offer their advertising space through PulsePoint.

PulsePoint claims to conduct over 2 billion transactions on its platform each day.

2.2.2 Retargeting

Retargeting is a type of online advertising where potential customers are shown ads related to goods and services that they have previously expressed an interest in buying. The aim of retargeting is to stimulate a purchase from these customers, converting interest into sale. The main users of retargeting are e-commerce websites, but content-focused websites also use retargeting to develop loyalty among their audience, drive advertising revenue and persuade customers to purchase subscriptions for online content.

Although retargeting involves very similar mechanisms to targeted advertising, there are important differences. Whereas targeted advertising increases the value of advertising space on websites or apps, retargeting is mostly used by e-commerce companies to increase their sales. Specialised intermediaries (sometimes called *retargeters*) help these e-commerce companies to track a consumer's web journey and enable targeted ads that promote the original product or service of interest to be shown to this consumer. Retargeting can be considered successful when the person being targeted comes back to the e-commerce site and completes a purchase.

Retargeters typically manage retargeting campaigns in their entirety. They generally offer retargeted ads on a CPM basis (which includes their fee), but other pricing models are available, including CPA and CPC. CPA-based models are particularly well-suited to retargeting and may

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[25]   http://www.pulsepoint.com

[26]   Endemic advertising is the placing of an advertiser's brand alongside a piece of related content – e.g. placing a display advert of a running shoe alongside an article about athletics.

involve an e-commerce website paying a retargeter a fee when a retargeted customer makes a transaction within an agreed period (30 days, say) of seeing the retargeted ad.[27] Some retargeters' propositions involve purchasing advertising space from publishers on a CPM basis (as for targeted advertising) and reselling it on a CPA basis. This reduces the risk for the advertiser, who only pays if the ad is successful, therefore increasing the perceived value of the retargeter's service.

Some e-commerce and content providers can manage their retargeting internally: this is, for example, the approach taken by Amazon.

Retargeting is one factor in the continued growth of the UK's e-commerce market, illustrated in Figure 2.2. As such, it is contributing to the shift in retail spending from 'bricks and mortar' to online retailers, although we cannot quantify the extent of this contribution. As more retailers develop an online sales presence and more consumers make purchases online, we expect retargeting to become a factor in the competition between e-commerce sites, rather than a mechanism to increase e-commerce revenue as a whole.

Figure 2.2: Online sales in the UK as a proportion of all retail sales (excluding automotive fuel), H1 2008 to H1 2013 [Source: ONS][28]
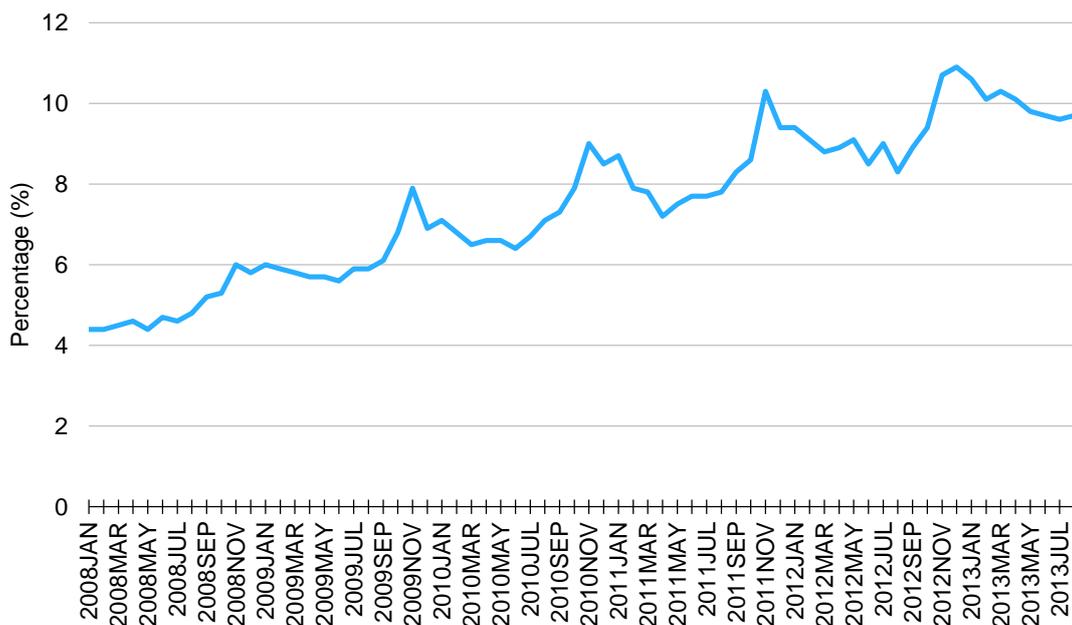
Please see Annex B for an illustration of the retargeting value chain and a wider discussion of the flows of data and funds, the market participants, and the importance of customer data in this business model.

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[27]   Please refer to Annex B for further details about the rates that retargeters charge e-commerce websites.

[28]   http://www.ons.gov.uk/ons/rel/rsi/retail-sales/august-2013/sty-patterns-in-retail-sles.html

Case study 2.2: AdRoll[29]

AdRoll is a specialist ad retargeter, with a reported 10 000 clients. Its platform enables e-commerce sites to retarget customers who showed an interest in a product/service but failed to make a purchase. The company attracts clients in part because it is able to deliver ads to a large number of ad networks and connects to many ad exchanges, including Facebook Exchange, Google AdX, Right Media and OpenX.

AdRoll's clients can track the success of their retargeting ads by measuring click-throughs and conversion rates. Its technology works by attaching a block of code (e.g. JavaScript) to the footer of its clients' websites, which enables it to track consumers as they move to different websites. The data collected by AdRoll is anonymised and used to serve retargeted ads on websites visited by potential customers, which it does by bidding for ad inventory on ad exchange sites.

AdRoll then purchases advertising space on a CPM basis on behalf of e-commerce sites and adds a fixed margin on top. The CPM charged by AdRoll ranges from USD1 (GBP0.62) to USD2.50 (GBP1.54), with an average value of CPM of USD1.41 (GBP0.87). AdRoll can also provide CPA and CPC pricing, but provides no details of this.

2.2.3 Recommendations and personalisation

The third business model of interest that we have identified in the online sector relates to the use of customer data in order to personalise services to match the interests of a particular customer or group of customers. In many cases, this personalisation takes the form of personalised recommendations, for example for e-commerce goods or for online content.

Online publishers (e.g. e-commerce sites, online newspapers and blogs, online video platforms) use personalisation and recommendations as important differentiators from most of their bricks-and-mortar counterparts.

The desired effect of personalisation and recommendations varies depending on the type of online business that makes use of them: for e-commerce websites, they are a form of direct marketing that aims to stimulate purchases or increase transaction values, as well as build customer loyalty; for content publishers and platforms, it is often customer loyalty and *engagement* that are important, helping to maintain and grow online traffic and therefore advertising revenues.

The approach to personalisation and recommendations is often subtly different for different websites and publishers, although they typically all rely on the identification of patterns and correlation. For example, an e-commerce website can seek to increase purchases by making recommendations based on customers' previous transactions: for instance, a customer who has

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[29]   http://www.adroll.com

recently purchased a printer can be offered ink cartridges suitable for that particular printer. Customers may also be recommended products that have been bought by other customers who share similar characteristics or interests, which the e-commerce website can identify from previous purchases as well as from broader online behavioural data such as browsing history. The ability of e-commerce websites, and to some extent publishers, to personalise their services and recommend relevant additional products or content is an important driver in the growth of online purchases in the UK.

Beyond driving transactions, personalisation and recommendations are used as a means to increase customer engagement and loyalty. The successful use of personalisation and recommendations results in improved market share for publishers and e-commerce websites, and these are therefore important competitive tools in the online sector.

In executing such a successful approach, the *relevance* of personalised services and recommendations is essential: a poorly-tailored recommendation can be worse than no recommendation at all, and online customers have come to expect relevant personalisation and recommendations. In order to achieve relevance, e-commerce websites and publishers rely on a combination of in-house tools and algorithms to identify patterns and correlations within their customer base, as well as external expertise and data from infomediaries.

In this context, infomediaries can play three different roles: in some instances they assist online publishers in analysing data when this is beyond their current capabilities; in other cases, they provide information that complements in-house data and helps to identify customers' interests; and finally, they can manage the definition and delivery of recommendations on behalf of publishers. In the latter case, our research suggests that infomediaries apply one of two pricing models: CPA pricing based on the percentage/number of recommendations that result in purchases, or a flat fee for a specified number of recommendations served to customers (similar to the CPM approach to display advertising).

For both e-commerce and publishing, the use of recommendations and personalisation is driven by the need to compete with online and offline competitors. This business model undoubtedly contributes to part of the roughly GBP2.4 billion annual revenue from non-search online advertising (chiefly from display and classified ads), as well as the estimated GBP80 billion in e-commerce spending for 2013.[30] Recommendations and personalisation will remain factors of growth in e-commerce and online advertising in the future.

Please see Annex B for an illustration of the value chain and more details on the market participants, flows of data and funds, and the importance of customer data in this business model.

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[30] Estimate of size of the display and classified advertising market is based on the assumption that display advertising accounts for 39% of online ad spend in 2013 and total online ad spend reaches GBP6.1 billion in 2013. These figures are based on http://www.iabuk.net/research/digital-adspend
Source for e-commerce data: Interactive Media in Retail, available at http://www.imrg.org/

Case study 2.3: Amazon[31]

Amazon is the world's largest online retailer, and in the UK it plays a major role in selling a wide range of goods, including books, clothing, household products and electronics. In addition, Amazon sells digital media, including ebooks (and the Kindle e-reader), digital music and video-on-demand content (through LOVEFiLM). It also provides a platform on which third-party retailers can sell products, and is a major provider of cloud services (Amazon AWS). In the UK, Amazon has over 20 million active customers and is the seventh most visited website.

Amazon has been very effective in increasing online purchases on its platform by making recommendations to customers based on their previous purchasing behaviour and their browsing history on Amazon's website. These recommendations are intended to increase sales per customer and build loyalty. Amazon also drives sales by sending email recommendations to customers and by using retargeting.

Amazon uses a wide variety of information sources to provide recommendations and personalised content. In particular, it uses cookies to identify a customer when they log in and track their browsing route through the website, the items in their shopping basket, and any preferences that they may have set (likes, dislikes). Amazon also uses information (online and offline data) from third parties in cases where it needs to complement its own data.

2.2.4 Data intermediation and sale of customer insights

As mentioned throughout this section, the availability of customer data has stimulated the emergence of new market participants called *infomediaries*. These specialised companies have developed business models focused on customer data aggregation, storage and compliance,[32] analytics and intermediation, particularly in the advertising value chain but also in support of personalisation of online services and tailored recommendations. As part of this portfolio of services, infomediaries have also played a role in enabling the wider availability of customer data across sites and online services, through the sale of customer insights to other infomediaries, advertisers and publishers. This has enabled participants in the online sector to enrich their own data and to segment customers by identifying a broader set of attributes than could be obtained from only one source.

Advertising intermediaries help advertisers identify consumers with specific needs or interests, so that they can be shown ads that are targeted to these interests. Relevant attributes used in identifying these needs and interests can relate to general aspects such as lifestyle (social, generational, hobbies, shopping behaviour) and demographic characteristic (gender, age, location, home ownership), or more specific indications of interest and the intent to purchase a

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[31] http://www.amazon.com

[32] Compliance – ensuring that the handling of data complies with e.g. contractual obligations and data protection laws and regulations.

product/service (for example, the fact that a customer has moved a particular item into their online shopping basket but has not completed the purchase).

Similarly, publishers may purchase customer insights to help them to more effectively sell advertising space on their websites or mobile aps by exposing a broader set of customer attributes to advertisers. Publishers that are better able to segment customers using a wider number of attributes can sell advertising space for targeted advertising more effectively.

The pricing models used by infomediaries are not transparent. Many of the services that they deliver are provided on a bespoke basis; for example, acting as a data collector or data processor on behalf of a specific client. We understand from secondary research that one common pricing model is volume-based, in which infomediaries provide standardised solutions and rates based on the volume of data accessed by their clients.

The business model of infomediaries turns on their ability to provide services that improve online ad targeting and retargeting, as well as personalisation and recommendations, which in turn raise the likelihood of online purchases and the financial value of those transactions. As such, infomediaries can be seen as facilitators and enablers in the online sector, improving the efficiency and effectiveness of advertising and e-commerce. They are part of the numerous factors that are driving the consumption of goods and services, including digital content, from bricks-and-mortar shops to online retailers and publishers.

We anticipate that the role and importance of infomediaries is likely to grow. Part of this growth will be linked to the broader adoption of targeted advertising, personalisation and recommendations by online publishers and e-commerce websites. In addition, interviews suggest that audience insights (appropriately anonymised or pseudonymised) will become increasingly important, as publishers and advertisers seek to generate additional revenues by enabling infomediaries to aggregate their data and sell it on.

Please see Annex B for a wider discussion of the value chain and market participants, the flows of data and funds, and the importance of customer data in this business model.

Case study 2.4: BlueKai[33]

BlueKai is a specialised infomediary whose core business consists in aggregating anonymised customer data from various sources, including publishers and other infomediaries. The company claims to be able to use 10 000 different, targetable attributes such as type of shopper (e.g. vertical retail), demographics, geography, purchasing frequency and lifestyle, in their analysis of customer data. BlueKai sells these insights to advertisers and ad agencies so that they can develop targeted display ad campaigns. It also helps publishers enrich their customer data using external sources in order to increase the value of their advertising space.

In order to support these propositions, BlueKai collates anonymised data from over 200 million consumers each month obtained from automotive, finance, travel and retail websites. It also collects data from online and offline data aggregators, including Acxiom, Bizo, DataLogix, Experian and Nielsen. The value that BlueKai adds is that it aggregates and analyses all this data, segmenting customers into many attribute categories, including demographic, lifestyle, occupation, purchase history and purchasing power. Clients can then develop targeted ad campaigns by purchasing the appropriate granular customer segmentations. BlueKai claims that it completes over 18 million data transactions per day.

2.3 Future growth: prospects and potential barriers

It is apparent from the research and interviews conducted as part of this study that the online sector will continue to use customer data in the ways described above. It will be monetised by infomediaries that fulfil a wide range of roles, and used by advertisers to spend marketing budgets efficiently, publishers to maximise ad revenue, and by e-commerce websites to increase sales and raise consumer loyalty. Most of these activities relate to better marketing and sales of products, services and content.

Although new types of uses may not be obvious at this stage, innovation in the online sector is rapid and often unforeseen. This supports the perception relayed by stakeholders in interviews that online business models making use of customer data will continue to develop and grow beyond the boundaries of the existing business models discussed here.

Another point of consensus in the online industry is the view that the sale of customer insights, obtained from collecting and processing a wide range of data, will continue to grow, both in support of advertising and as a way for advertisers, publishers and offline data aggregators to find new revenue opportunities.

Our research and interviews clearly indicate that that regulatory policy and consumer sentiment can play an important role in supporting or inhibiting growth in the commercial use of online customer data. None of the stakeholders we spoke to said that existing regulations in the UK currently present

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[33]   http://bluekai.com/

any significant barrier to innovation and the use of customer data in the online sector. This being said, some stakeholders have indicated that they would welcome more clarity about what data is personally identifiable and sensitive, particularly as new types of data start to be collected (including biometric and facial recognition data, location data, and information from social media sources).

Based on our interviews and secondary research, industry players appear sensitive to consumers' concerns about privacy, and the inappropriate use of data.[34] Infomediaries, who typically do not have direct contact with consumers, are also cautious when using customer data or selling customer insights.

The focus of both consumer-facing market participants and the intermediaries they work with is two-fold: they are intent on preserving their reputation and the trust of consumers, and they must satisfy legal and regulatory requirements, which are enforced not only by external regulators but also by internal legal teams. The industry stakeholders we interviewed recognise explicitly the importance of data privacy, and seek to be transparent and follow 'best practice', which they consider to be best represented by industry-developed guidelines (see Annex B for further details). They are aware that the data they collect about consumers is core to their business, and do not want to do anything that would risk damaging consumers' relationship with their brand, or their own relationship with other parties such as offline data aggregators.

Some of the infomediaries we interviewed have voluntarily taken additional precautions to avoid potential adverse reactions from consumers and the resulting 'bad press' – for example, they do not collect data about, or deliver targeted ads to, people under the age of 18. This is significantly more conservative than what the law requires: in the USA the legal limit is 13,[35] while in the UK a 12 year-old child needs parental consent before companies can collect data about them, and 16 is the minimum age without parental consent.[36] Other infomediaries intentionally avoid collecting certain kinds of personal information; for example, some companies, to be cautious, remove part of customers' IP addresses from records, since there is no worldwide consensus regarding whether a user's IP address can be considered to be personal data.

This concern for consumers' privacy being acknowledged, there is a consensus among industry stakeholders that collecting data is easier with an opt-out rather than opt-in approach.[37] A widely shared view appears to be that as long as the user is informed and has some degree of control, then it is fair to collect data within the bounds of the policies that companies expose to the user. If

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[34]   This may or may not coincide with the definitions of 'personal' and 'sensitive' data in law, although broadly those are likely to be of most concern to consumers.

[35]   http://www.coppa.org/

[36]   http://www.cap.org.uk/Advice-Training-on-the-rules/Advice-Online-Database/Database-practice-Children.aspx

[37]   This view from industry stakeholders is perhaps unsurprising to the extent that it reflects a 'status quo bias' on the part of consumers, which translates into a tendency to retain default options to a greater extent than preferences would suggest; in the case of an 'opt in' regime, such bias would translate in a lower number of people opting in than would be the case in an 'opt out' regime. The latter would therefore be preferable from the perspective of stakeholders who collect data. See for example Samuelson, Zeckhauser, 1998, *Status Quo Bias in Decision Making*, as well as Johnson, Bellman, and Lohse, 2002, *Defaults, Framing and Privacy: Why Opting In-Opting Out*, for a discussion more closely related to online consent

customers do not want their data to be collected they can decide not to be tracked, and a range of different solutions are provided by market participants. Nevertheless, this remains a delicate issue as consumers may or may not be aware of the terms they are accepting by browsing and using apps; we examine this issue further in Section 6.

3 Use of customer data by the audio-visual sector

The use of online customer data is new to broadcasters, but can help improve their offering to advertisers

The audio-visual sector as considered in this report consists of the public service broadcasters (PSBs) and the pay-TV platforms. The most important source of revenue for commercial PSBs is traditional advertising on linear TV, whereas pay-TV operators derive most of their revenue from subscriptions.[38] Online customer data is not yet used extensively, as traditional sampled customer data (typically from viewer panels) remains the primary source of information about audiences. Nevertheless, a number of business models centred on online customer data are emerging: targeted advertising on online and VOD platforms, targeted ad insertions into linear programming, and personalised content recommendations. In addition, traditional panel-based data collection is evolving, giving an increasingly important role to online customer data.

- Targeted advertising on online platforms is being rolled out by the commercial PSBs. It is supported by online customer data, and by new advertising formats such as Channel 4's Adapt product. In improving their ability to serve targeted ads, the PSBs are responding to advertisers' requirements and the competitive threat of online intermediaries who already offer targeted video advertising. This will enable the PSBs to extend their successful integrated ad sales model from linear TV to the online world, as non-traditional advertising revenues such as from online and VOD play an increasingly important role.

- Targeted ad insertion on linear TV is a very new approach which dynamically substitutes standard advertising spots on a linear channel with ads targeted to specific audiences. This is becoming possible through innovation in set-top boxes and smart TVs. It represents an additional (albeit limited) threat to the PSBs' integrated ad sales model, as it enables platform providers and device manufacturers to enter the advertising value chain.

- Personalisation and recommendations are becoming more prevalent in the audio-visual sector. These are important marketing tools in developing customer engagement and loyalty in the online space, where multiple content delivery platforms are already competing aggressively.

- Finally, traditional sampling-based methods based on viewer panels are evolving to make wider use of online customer data. This is affecting the data used in valuing traditional linear advertising, and provides additional information that may be useful in improving audio-visual content.

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[38] Bundles including pay-TV and broadband services are now a major part of the market, and in this section we focus exclusively on aspects related to TV as opposed to broadband; see Section 4 for a discussion of the relevance of online customer data for broadband operators.

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Looking ahead at future developments, we expect the importance and value of online customer data in the audio-visual sector to be closely linked to the shift in audiences and revenue from linear TV to online platforms. This has remained a slow process to date, but the proliferation of personal devices such as tablets is increasingly fragmenting TV viewing and the consumption of audio-visual content online.

3.1 Overview of the value chain in the audio-visual sector

The audio-visual sector in the UK, defined for the purpose of this study as the public service broadcasters (PSBs) and pay-TV platforms, relies primarily on a combination of licence fee, advertising and subscription revenues as the main source of funds. Customer (audience) data is used mainly to support advertising. Online customer data remains a fairly small subset of this data, as linear TV advertising (which represents about GBP2.5 billion in annual revenues for the commercial PSBs)[39] remains dependent on statistical samples rather than online customer data for its valuation.

As a result, the use of online customer data is a fledgling phenomenon in this industry and chiefly relates to the online delivery of audio-visual content, through VOD and catch-up services for example. Nevertheless, interesting models are emerging both in the form of new advertising models such as dynamic ad insertions in linear programming and personalised content recommendations, both of which we discuss later in this section. Finally, in the future, online customer data is likely to be an important source of information about TV audiences, complementing if not replacing traditional sample-based statistical models.

The types of online customer data collected for or by the audio-visual sector are similar to those collected for the online sector, and the value chain and mechanisms used are also broadly similar. Audience data, typically related to viewing habits and lifestyle attributes, is collected and then used to support a number of business models. Sometimes an aggregator combines the viewing data with other customer data unrelated to viewing, and sells the resulting information to participants in the audio-visual sector. These audio-visual companies then use the data internally within the company, for example to improve content commissioning, or externally, for example for advertising.

The various roles in the value chain fall broadly within three categories:

- Data collectors and aggregators, including organisations that measure TV audiences and third parties that combine audience data with other customer datasets (note that these may be sourced from an interactive pay-TV platform).

- Content producers and distributors such as TV broadcasters, pay-TV platforms, VOD service providers and over-the-top (OTT) platforms which may operate via linear TV and/or online.

- Advertisers and advertising intermediaries such as agencies, media planners and buyers.

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[39]   Source: ITV's and Channel 4's financial reports.

The customer-data business models used by companies in the audio-visual sector can be split into two groups:

- Traditional business models use statistical aggregation based on data samples, often collected from a pre-defined panel. This allows broad and approximate targeting and has so far been seen as sufficiently informative to value advertising targeted at large audiences, which is the core business of the commercial PSBs.

- New 'online' business models use detailed customer data that enables more tightly focused ad targeting. The relevance of these models is two-fold: on the one hand they enable advertising to smaller audiences (e.g. those achieved by relatively small digital channels) to be more accurately valued; and on the other hand, they are in line with the practice of targeting ads online, which is relevant as part of the continued increase in online business for traditional broadcasters.

These business models are described further in the following section.

3.2 Business models in the audio-visual sector that rely on customer data

We consider the newer, online business models first. These can be grouped into three: targeted advertising online and on VOD, targeted ad insertions on linear TV, and personalised recommendations. We then examine the impact of online customer data on traditional business models.

3.2.1 Targeted advertising online and on VOD

This model involves the tailoring of the ads shown according to the profile of viewers before, during or after the programme (known as *pre-roll*, *mid-roll* or *post-roll*). Targeted advertising is currently primarily delivered via VOD, which is chiefly used on connected devices[40] and allows two-way communications between the VOD provider and consumers.

Advertisers pay for these ads on a CPM basis, and higher CPM rates are charged for smaller and more attractive niches. Channel 4's online CPM rates range from GBP10 for banner advertising to GBP30 for pre-roll.[41]

In August 2013, Channel 4 launched a new VOD advertising product, called Adapt, for its VOD service (4oD). 4oD requires viewers to register if they wish to watch programmes that were broadcast more than 30 days ago. On the basis of the information available from their registration profile and other online sources, these viewers can be shown advertisements targeted to their age group, gender or location. Channel 4 also uses cookies to monitor the viewing habits of visitors to its website.

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[40] Some VOD viewing (e.g. on Sky's satellite platform) is effectively done offline, through pre-loading of content onto set-top boxes.

[41] http://www.channel4sales.com/uploads/assets/mediapack_2013_08_09.pdf

Revenue from this business model is increasing strongly. ITV's online and interactive revenues (from ITV Player) rose by 26% in 2012 to reach GBP102million.[42] Similarly, Channel 4's non-traditional ad revenue increased by 50% between 2011 and 2012,[43] in part due to 4oD's new advertising formats. For both broadcasters, these new forms of revenue represent a similar proportion of total revenue, around 4% in 2012.

However, the net effect across the customer-data value chain in the future is not clear. This is for several reasons: online CPMs are typically lower than linear TV CPMs; broadcasters are wary of intermediaries increasing their involvement and taking a cut of advertisers' overall spend; and finally, targeting may lead to a decrease in the value of certain audiences, and a premium for others, potentially reducing the range of programmes that can be broadcast profitably.

Please see Annex C for a wider discussion of the flows of data and flows of funds, the importance of customer data in this business model and an illustration of a value chain.

> **Case study 3.1: 4oD**[44]
>
> Channel 4 is a UK commercial broadcaster with a PSB remit stipulating an obligation to fund and broadcast innovative and diverse programming. Its on-demand product, 4oD, is available online, via mobile and through third-party platforms (e.g. Sky and Virgin Media). 450 million full-length programmes were viewed in 2012.
>
> Channel 4 currently generates over 90% of its revenue from traditional advertising, but is progressively diversifying its revenue towards non-traditional streams such as online advertising. Channel 4 obtains demographic and geographical data that can be associated with a specific viewer by requiring users of its 4oD service to register in order to watch older programmes. External datasets are also used. Data is then analysed and used for pre-roll targeting of ads.
>
> Advertisers pay for advertising on 4oD as well as for website ad inventory such as banners. These are charged on a CPM basis, with a pre-roll advert priced at around GBP30 per thousand views.
>
> In support of this diversification, Channel 4 now offers a range of innovative advertising products, including Adapt, which targets advertising on 4oD. Non-traditional advertising revenue, such as that generated by 4oD, accounted for 4% of total revenue in 2012.

3.2.2 Targeted ad insertions on linear TV

Advances in technology mean that broadcasters and pay-TV operators are now able to show targeted advertising over traditional linear TV. This relies on functionalities and features of the pay-TV platform itself and/or the connected device used by the viewer (e.g. set-top box, connected

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[42]   http://www.itvplc.com/sites/itvplc/files/ITV%20Annual%20Report%202012.pdf

[43]   http://www.marketingweek.co.uk/news/channel-4-banks-on-innovation-to-boost-2013-revenue/4006665.article

[44]   http://www.channel4.com

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TV). This type of targeted advertising, sometimes called *dynamic ad insertion*, delivers ads that are tailored to a specific household, and therefore may be different from the standard linear ads that are being served at the same time to other households.

In this business model, advertisers can choose which audiences to target, using segment information supplied by the broadcaster. In general, the smaller, more specific and niche the targeted segment is, the higher the CPM rates:[45] advertisers have to pay more to take advantage of being able to reach a specific consumer segment that is more likely to buy the advertised products.

In the UK, this business model is very new, and is primarily used by Sky on its own channels using the Sky AdSmart product, launched in 2013.[46] Sky can segment customers by their so-called 'mosaic lifestyle' (a classification incorporating demographics and behaviour), financial profile, age and living situation, geography, home ownership and household composition.[47]

We understand from interviews that some broadcasters place a high value on traditional advertising, are intent on protecting this, and remain unsure of the benefits of targeting. Because the ability of platform operators to insert ads dynamically into linear channels is dependent on broadcasters agreeing to it, this is an important barrier to the expansion of this business model. Furthermore, the ability to deliver such ads is dependent on customers having access to the right platform or device, which further mitigates the potential threat to broadcasters' linear advertising business.

As a result, we expect this model to develop relatively slowly as a *complement* to traditional linear advertising models, providing an additional revenue stream for broadcasters and pay-TV operators.

Please see Annex C for a wider discussion of the flows of data and flows of funds, the importance of customer data in this business model and an illustration of a value chain.

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[45]   Source: industry interviews.

[46]   http://www.skymedia.co.uk/sky-adsmart/about-sky-adsmart.aspx

[47]   http://www.skymedia.co.uk/sky-adsmart/audience-selection.aspx

Case study 3.2: Sky AdSmart[48]

Sky is a satellite pay-TV operator with 10.5 million subscribers in the UK at the end of September 2013. Sky hosts a number of its own channels, focusing on specific genres, and sells advertising on these as well as other channels, on multiple devices. The company's primary source of revenue is pay-TV subscriptions and other communications services. It also receives revenue from PSBs hosted on the Sky platform. Advertising represents just 6% of Sky's revenues.

The company is currently launching the Sky AdSmart product to target advertising over linear TV, as well as online and mobile on Sky's own channels. Sky AdSmart is available in 500 000 households that have the appropriate set-top boxes (which send back viewing information overnight).

In addition, Sky receives customer data from a number of sources, including BARB (of which Sky is a shareholder), the SkyView panel, the Sky IQ panel, an Ipsos panel (for out-of-home viewing such as in pubs, gyms and hotels), and the UKOM panel (across devices). Basic demographic and geographical data is collected, as well as more sophisticated behavioural information. The data is analysed and sold externally as part of the Sky IQ offering (see Case Study 3.6).

For advertisers, Sky AdSmart services are priced in a similar way to traditional advertising. The cost of a campaign is based on CPMs and the number of views.[49] We understand that advertisers pay a premium for targeted advertising, with higher premiums for more attractive segments.

3.2.3 Personalised recommendations

Besides advertising models, which are an extension to the traditional business of broadcasters, the audio-visual sector has started to use customer data to make personalised recommendations of programmes that viewers may enjoy. These recommendations can be delivered in multiple ways, for example via an online user interface or an email campaign.

Preferences are identified by analysing viewing behaviour over time. The intent in promoting content that viewers are likely to enjoy is to improve customer retention and achieve higher audience shares for the broadcaster in question. Personalised recommendations are most commonly provided on OTT and VOD platforms as viewers or customers have to sign in to use these services, and so it is possible to track what programmes have been watched and to display recommendations. Suggestions for premium content may also generate additional revenue (if a new subscription is needed, for example).

A variety of possible recommendation models are being explored by the industry, such as the BBC's intention to include an 'online channel' for each viewer based on their preferences in iPlayer,[50] as well as to add more sophisticated recommendations. Channel 4 and ITV use data

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[48]   http://www.skymedia.co.uk

[49]   A 'view' is counted if over 75% of an advert is watched at normal speed.

[50]   http://www.bbc.co.uk/mediacentre/latestnews/2013/dg-iplayer.html

provided by viewers registering on their VOD platforms (e.g. age group, location and gender) to suggest relevant programmes.[51] Viewers can also create a playlist of favourite programmes.[52]

Although content recommendations are currently not a key business model in the audio-visual sector, we expect they will become more important as viewing moves online, a space where many content delivery platforms already compete.

Please see Annex C for a wider discussion of the flows of data and flows of funds, the importance of customer data in this business model and an illustration of a value chain.

Case study 3.3: TiVo (distributed by Virgin Media)[53]

TiVo is a set-top box that provides a user interface for linear and on-demand viewing, as well as a personal video recorder (PVR). In the UK, TiVo is available as part of Virgin Media's cable pay-TV offering, for an additional fee.[54] As of January 2013, Virgin Media had 1.3 million TiVo subscribers (35% of its subscriber base).[55] In the USA, it can be purchased standalone or as part of a pay-TV package.

The TiVo remote control includes 'thumbs up' and 'thumbs down' buttons that allow customers to communicate their opinion on programmes they watch. This allows TiVo to provide a list of suggested programmes, some of which may be saved in the On Demand section of the interface.[56] Personalised recommendations are used to improve customer experience, create a better-quality service and encourage viewers to use it more. The increased viewership that results from this can also increase advertising revenues from banners and ads that show while recorded programmes are paused.

TiVo delivers advertising inventory in the form of banner advertising and pop-up adverts that are shown when programmes are paused. Sources suggest the service will soon offer targeted advertising insertions in linear content as well.[57]

3.2.4 Business models based on statistical aggregation of a sample

These more 'traditional' business models rely on using data from panels and surveys to draw conclusions on the TV viewing behaviour of the entire audience. This is done by modelling or statistical aggregation based on a sample. Although these business models predate the use of

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[51]   http://annualreport.channel4.com/investing-in-data

[52]   http://www.wired.co.uk/news/archive/2011-08/25/40d-rebuild-features

[53]   http://www.virginmedia.com/tivo

[54]   Virgin Media's primary revenue source is pay-TV subscriptions, with TiVo available for an additional cost of around GBP5 per month, depending on the package bought.

[55]   http://investor.tivo.com/phoenix.zhtml?c=106292&p=irol-newsArticle&id=1789525

[56]   http://store.virginmedia.com/discover/tv/tivo/explore/clever-stuff.html

[57]   http://www.marketingmagazine.co.uk/article/1106609/virgin-media-launch-targeted-tv-ad-service-2012

online customer data, they are impacted by it and are likely to evolve as a result of such online data being available. Below, we consider traditional advertising (linear TV and online), content improvement and sale of customer insights and analytics.

Traditional advertising (linear TV and online)

As mentioned earlier in this section, the core revenue-generating business of commercial broadcasters in the UK is the sale of advertising slots to advertisers or their agents. The price of advertising slots is determined using customer data from samples of the population, statistically aggregated to be representative of the whole country; these statistics help advertisers to assess the value of the segment of the population which is likely to watch a particular slot. For TV, the average CPM rates are around GBP3–5.[58]

Since the 1980s, TV viewing data has been collected by the Broadcasters Audience Research Board (BARB),[59] an organisation formed in partnership with broadcasters that collects data from a panel selected to be representative of the country as a whole. BARB remains a trusted source of viewing data and is backed by all the major broadcasters, including Sky. Data was initially collected offline, but is now communicated in online form. Broadcasters also use their own data, surveys and panels as well as data from other third parties such as research firms like Nielsen.

The UK's TV advertising market has been broadly stable over the last five years. As shown in Figure 3.1 below, an overall margin of about 20% (the gap between advertising investment and spend) is retained by intermediaries such as sales houses, ad agencies and media buyers. We note that broadcasters such as ITV and Channel 4 are able to keep around 15% out of this 20% margin, as they have their own sales houses, meaning that only 5% is retained by intermediaries.

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[58] Analysys Mason estimate, based on two sources:
http://www.guerillascope.co.uk/TVAdvertisingAgency/TVAdvertisingCHANNELS/ITV1tvadvertising.aspx;
http://www.independent.co.uk/news/business/news/cost-of-tv-ads-falls-to-lowest-in-decades-as-recession-bites-1699462.html

[59] http://www.barb.co.uk/

Figure 3.1: Net TV advertising revenue and investment in the UK, 2008–2012 [Source: Analysys Mason, based on data from Thinkbox and Ofcom, 2013]
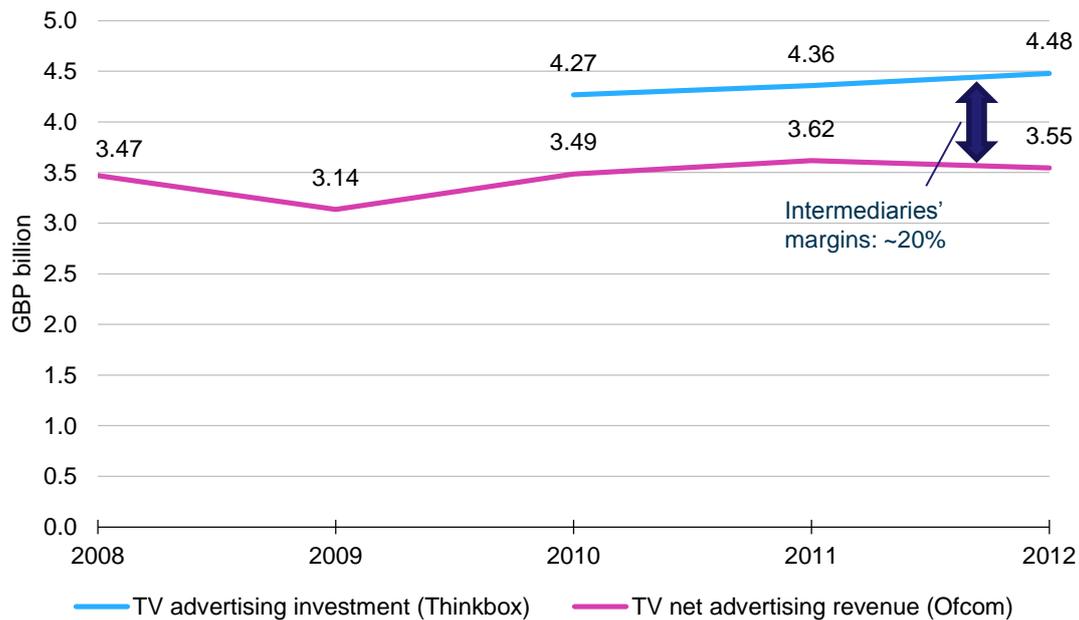
A few broadcasters, chiefly Channel 4 and ITV, capture the vast majority of TV ad revenue in the UK (around 60% to 70% of the market), due to their popular content and the large audiences they attract.

Please see Annex C for a wider discussion of the flows of data and flows of funds, the importance of customer data in this business model and an illustration of a value chain.

Case study 3.4: ITV's linear advertising business[60]

ITV is a commercial broadcaster with a PSB remit. It delivers content across multiple platforms and devices, including its on-demand service ITV Player. Its share of viewing in 2012 was 22.3%, and its share of the UK TV advertising market was 45.8%. The broadcaster's primary source of revenue is advertising via linear TV or online, and content deals with OTT providers and pay-TV platforms that host its on-demand programming. Other pay-TV deals and merchandise also contribute to its revenue.

ITV primarily relies on BARB for customer data. Audiences are categorised into 15 segments, including by age, gender, occupation and socio-economic group. Trends from this data are extracted, such as the level of social media interaction, connectivity, 'business' and traditional TV viewing behaviour, and published on the ITV LIVES portal, which is a tool to help advertisers choose their target segment and design their campaigns. Age and location data for viewers is also collected when they register online.

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[60]   http://www.itv.com

Advertisers pay for a slot based on the time of day, programme and number of viewers. High-profile slots are sold by auction. ITV funds data collection through its stake in BARB.

We note that ITV is also active in some of the other business models described in this subsection, such as personalised recommendations for registered users of ITV Player, and content improvement by communicating viewing trends when commissioning programmes.

Content improvement

The audio-visual sector can use customer data to improve content in two ways. Firstly, market participants can monitor the popularity of programmes by viewer segment, and use this to understand what types of content and programming they should commission in the future. Secondly, they can test viewer responses to content by showing samples or clips and monitoring the feedback received. More attractive content can lead to increased subscriptions to pay-TV or OTT services, and more viewers, which in turn increases advertising revenue. This is a minor business model in terms of its use of customer data, revenues and value added for broadcasters and platforms, but there are interesting online examples such as LOVEFiLM, presented in the case study below.

Case study 3.5: LOVEFiLM[61]

LOVEFiLM is a subscription OTT platform that provides streaming services and rents DVDs, Blu-ray and games. It was acquired by Amazon in 2011, and now has over 2 million subscribers. The app is available on PCs, tablets, games platforms, pay-TV platforms and set-top boxes. LOVEFiLM operates a subscription-based business model. It also receives revenue from leaflet advertising accompanying its DVD, Blu-ray and games deliveries.

LOVEFiLM has followed in the footsteps of its competitor Netflix, by commissioning its own original programming using consumer feedback on pilot episodes. 11 comedy and children's TV pilots by Amazon Studios were made available to subscribers, and consumer feedback was used to determine which should be developed for a full season. Five programmes were selected to be shown in late 2013 and early 2014.

By showing content that its subscribers like, LOVEFiLM aims to retain customers (particularly important, as the service is paid for on a month-to-month basis) and attract new ones. Consequently this activity should result in more efficient allocation of programme commissioning funds, and higher gross margins.

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[61] Now called Amazon Prime Instant Video; see http://www.lovefilm.com

Sale of customer insights and analytics

Companies in the audio-visual sector can monetise data by selling on customer (audience) insights and analytics to third parties as their own product. This may involve selling analysis of data that has been collected by the company first hand, or combining in-house data with third-party data and packaging this as a product. Apart from BARB, there are very few market participants in the audio-visual sector that adopt this business model, notably Sky IQ, which is also based on a panel-based methodology (see Case Study 3.6 below).[62] The PSBs do not sell audience insights, in part due to the potential for a negative consumer response to this practice, but also in our view because they still have limited means to collect this data on a broad scale.[63]

Selling customer insights and analytics represents a very small proportion of revenue (for example, for Sky just 5% of its advertising revenue and 0.3% of its total revenue).[64] It is not expected that this will grow significantly in the short term.

Please see Annex C for a wider discussion of the flows of data and flows of funds, the importance of customer data in this business model and an illustration of a value chain.

Case study 3.6: Sky IQ[65]

Sky IQ uses customer data to help companies understand their customers' behaviour, and link it back to TV advertising in terms of target segment and measurement of advertising effectiveness. Sky IQ's services are aimed at advertisers, broadcasters and agencies.

Sky IQ primarily uses data from a panel of 500 000 homes, which includes demographic, geographical, value and affluence data, as well as TV behaviour and preferences (see Section 3.2.2). It combines this with its clients' data, including response measurement, to help determine which segments to target and how to design advertising campaigns to achieve a greater return on investment.

This service is separate from Sky Media's advertising offerings, though it is evident that clients which use Sky IQ are likely to advertise with Sky. The payment model and prices are not publicly available, but are likely to be time/project-based rather than performance-based.

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[62]   We note that other companies such as TiVo and Zeebox collect viewing data and are able to monetise insights derived from this data.

[63]   Besides commissioning their own surveys, the PSBs have access to customer data collected through their online VOD platforms as well as YouView. They do not, typically, get access to customer data collected by third-party implementations of their VOD clients, such as 4oD on the Virgin Media platform, for example. This explains some of the limitations placed by the PSBs on such implementations: for example, 4oD catch-up is limited to seven days on Virgin Media.

[64]   Source: Sky's financial reporting.

[65]   https://www.skyiq.com/

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3.3 Future growth: prospects and potential barriers

While companies in the audio-visual sector already have the capability to collect online customer data, they do not always actively do this, as they have yet to establish the economic benefit of doing so. This point links to the doubts of broadcasters regarding the potential of targeted advertising.

An important driver for the use of online customer data will undoubtedly remain the progressive increase in the commercial PSBs' revenues stemming from online content delivery. Consumption of TV online is increasing rapidly, and TV watching is becoming more individual as one person in a household may watch the TV set whilst another may be watching on-demand content on a tablet. This trend is likely to continue and may accelerate over time as personal connected devices continue to become more prevalent. This means that content owners (e.g. independent producers) have an opportunity to move content online, potentially away from linear TV, thus threatening PSBs' revenue streams. In such a case, online intermediaries are well positioned to play a role in helping online properties to generate revenues.

We expect this will be a slow process, but the ability of the commercial PSBs to retain their advertising sales function in-house, rather than outsourcing it to online intermediaries, is a powerful incentive to develop the ability to compete with these intermediaries. Indeed, there are already significant pressures from both online intermediaries and content rights owners. A view shared by several interviewees is that intermediaries like Videology are well positioned to sell ad slots online alongside VOD, and have the technology and relationships in place to do so effectively. In parallel, content rights owners are increasingly using their rights to distribute their programmes on different platforms directly, rather than through broadcasters.

The ability of pay-TV platforms and device manufacturers to dynamically insert targeted ads provides an additional threat to the current positioning of the commercial PSBs in the advertising value chain, albeit one that remains limited by the need for broadcasters to agree to targeted ads being inserted into their programmes.

Nevertheless, these threats are relevant to the funding model of the PSBs: currently, we estimate that Channel 4 and ITV capture up to 95% of the investment made by advertisers on their channels, which means intermediation costs are only around 5% of ad spend. However, intermediated advertising models, and in particular online models, typically see more than 20% of ad spend going to intermediaries. This translates into a value at risk of the order of 15% of ad spend online on commercial PSB websites. On the basis of the current online ad revenue of the commercial PSBs, the value at risk is modest (an estimated GBP20 million out of total non-traditional advertising revenue of GBP138 million in 2012), but this will increase as online advertising revenues becomes a larger share of broadcasters' revenue. Given the relatively low cost of the ad sales functions for a large broadcaster, this may have a significant impact on profits.

In responding to these threats, we expect broadcasters to use online customer data to develop a more sophisticated understanding of their audiences. This would enable them to compete with online intermediaries and possibly retain their current position in the advertising value chain.

Other interesting business models have been suggested, such as using customer data to better understand the price that customers are willing to pay for their pay-TV or VOD subscriptions (a form of price discrimination).[66] Another model involves using personalised recommendations to promote sponsored suggestions for programmes that may appeal to a particular viewer, similar to the use of sponsored links on the Google search results page. However, these new business models are unlikely to add significantly to existing sector revenues.

Stakeholders appear to be aware of – and comfortable with– the current legal and regulatory boundaries for the use of customer data. Therefore, this should not be a significant barrier to future growth in this sector.

Stakeholders are highly aware of consumer sentiment and attitudes, and interviewees often mentioned the failings of the BT–Phorm collaboration (see Section 4.1). Broadcasters are particularly keen to keep within the boundaries of what consumers expect in terms of use of their data, as they have strong brands that are key to their commercial success.

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[66] http://www.washingtonpost.com/blogs/the-switch/wp/2013/09/04/how-netflix-could-use-big-data-to-make-twice-as-much-money-off-you/

4   Use of customer data by the fixed and mobile telecoms sectors

Use of customer data by mobile operators is becoming more sophisticated, with operational and competitiveness improvements being the main drivers

Fixed and mobile telecoms services are an essential part of people's everyday life. As a result, operators have a direct relationship with the vast majority of people in the UK, and collect significant amounts of online customer data as part of delivering services. Advances in network IT systems and investment by operators in analytical tools are enabling them to make wider use of this customer data, both internally (to improve marketing and network management) and externally (by providing targeted advertising and developing innovative services).

- Operational improvements are likely to remain the most important use of customer data by telecoms operators. Detailed analysis of large amount of customer data enables them to understand their customers better, and to create services that are tailored to a large number of small, specific groups through micro-segmentation. In addition, operators are able to use the insights derived from customer data to better manage scarce network capacity, for example by prioritising services that are more important to their customers while constraining the use of bandwidth by other services. In the short term, such improvements are a competitive tool that successful operators can use to capture new customers; while in the longer term, they may enable a permanent reduction in churn (which also improves market share). Illustratively, a long term decrease of 10% in the number of churners for a typical mobile operator in the UK could be worth over GBP100 million.[67]

- Targeted advertising (online and through messaging) is commonly used by fixed and mobile operators as a means to generate additional revenue. Such revenue remains, however, very marginal (a few million pounds out of total revenues in the billions for a typical operator) and prospects for growth are limited as most advertising delivery occurs over the top on webpages and apps not controlled by operators.

- The integration of online advertising networks into mobile operators is an ongoing experiment being made by, for example, in SingTel Group in Asia and Sprint in the USA. This model seeks to use customer data collected by the mobile operators to provide additional targeting information to advertisers. So far this model is not widespread.

- Packaging and sale of customer insights is another area of experimentation for operators such as Telefónica and EE in the UK, with a focus on real-time mobile location data. Operators are proceeding carefully in developing such services, as previous experience both in UK (BT–Phorm) and elsewhere (Telefónica Smart Steps in Germany) has shown how sensitive customers can be to perceived misuse of their data. From a revenue perspective, this

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[67]   See Section 4.2.1

opportunity remains extremely small, and other parties (e.g. Google) also increasingly have access to real-time location data.

Looking ahead, we expect these trends to continue without fundamental changes to the relative importance of the different models: internal uses of customer data will remain the most important in this sector. In practice, operators tend to refrain from being too radical in developing new uses of their customers' data because the risks associated with negative reactions from their subscribers far outweigh the as yet marginal benefits that can be obtained from these new data-centric business models.

4.1 Overview of the value chain in the fixed and mobile telecoms sectors

The fixed and mobile telecoms markets in the UK are increasingly saturated.[68] This translates into revenue pressures[69] which are pushing operators to innovate in order to reduce their costs and create new revenue streams. In parallel, mobile data usage has been growing quickly,[70] and online ecosystems are becoming increasingly sophisticated, offering consumers multiple alternatives to the traditional telecoms services of voice and messaging. This trend threatens to commoditise operator's businesses, a phenomenon they are trying to prevent by positioning themselves as providers of new services, as well as making better use of their relationships with customers.

Online customer data[71] is increasingly seen as an important asset that fixed and mobile operators can use to improve efficiency of operations, marketing and sales. Our research suggests that it is internal uses of data that are most relevant for operators, serving as a competitive tool in offering better services to customers. External uses include the ability to offer targeted advertising on operators' online portals or via SMS and MMS.[72] There are few examples of operators using online customer data more broadly: in the UK, Telefónica is experimenting with specific location-based services, and internationally SingTel and Sprint are expanding into the online ad network market, focusing on mobile advertising.

Customer data (both online and offline) is already widely used by mobile and fixed operators to support marketing activities (through broad segmentation of the market based on relatively simple customer characteristics) as well as for network management (for example, aggregated network data and statistics on customer complaints are used to monitor problem with network capacity and quality of service).

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[68]   Analysys Mason research shows that for the UK, mobile subscriber penetration has risen by just under 0.4% in the last 12 months, whilst fixed voice penetration appears to have risen by around 1.4%.

[69]   According to Ofcom's Communications Market Report 2013, fixed and mobile operator revenue in the UK fell around 8.5% from GBP42.1 billion in 2007 to GBP 38.8 billion in 2012. Source: http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr13/uk/

[70]   Global mobile data traffic grew by 70% in 2012, although this has not offset declining revenue; see http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html

[71]   In this sector, online customer data can be defined as data that an operator collects on individual customers' behaviour on its telecoms network.

[72]   MMS – Multimedia Messaging Service, a short video clip sent via a mobile phone

Technological evolutions and commercial pressure are creating an environment where online customer data is becoming more important. The amount of such data that is available to a network operator is vast: it includes usage and location data, Internet browsing habits, telephone call patterns and real-time location data. In addition, because customers have a contractual relationship with their service providers, operators also have access to data related to the age, gender, address and credit rating of their subscribers, which can be used in conjunction with online customer data to gain a granular understanding of their customer bases.

In the past, BT and others partnered with Phorm, a UK-based company whose purpose was to enable ISPs to serve targeted advertising over-the-top by analysing browsing data from the network. This led to a very strong consumer backlash and the UK operators now appear extremely cautious in how they use this type of data.[73]

Perhaps as a result of these issues, online behavioural data (i.e. for example, information on the websites a customer visits) is mostly collected with a fairly narrow purpose in the UK, typically to enable functionality such as parental controls, to support network improvements and to provide information for law enforcement and national security. The online customer data that is more broadly collected by operators relates to network usage and location.

International examples of a broader use of browsing data include Verizon Selects[74] in the USA, which enables Verizon's subscribers to opt in to a programme where they share their location, web browsing and usage data, and then receive targeted marketing and content via post, email, text, Internet and mobile advertising.

The various roles within the fixed and mobile value chain can be summarised as follows:

- network operators, the customer's fixed or mobile (or both) network provider

- data collectors, who collect data on behalf of operators

- advertising networks, which aggregate advertising demand and advertising inventory, acting as the facilitator between the two

- third-party data providers, which sell customer insights to the operators which is then merged with their own in-house customer data.

A network operator can fulfil multiple roles in the value chain (in addition to network operations); in this report we consider primarily the roles of data collector and advertising network. Operators

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[73]   In February 2008, Phorm announced that it has signed deals with the UK's then three largest ISPs; BT, TalkTalk and Virgin Media. BT subsequently conducted a trial in 2008, using Phorm to characterise users' Internet traffic passing through ISPs in order to serve targeted ads, scanning webpages for keywords. There was intense consumer backlash and legal proceedings ensued but were later dropped, which culminated in BT dropping its ad service. The ICO clarified that such systems should be 'opt in' only.

We understand that Phorm faced similar problems in the USA, in which targeted ad services were delivered to by Wi-Fi services providers, and also in South Korea. Phorm now operates on an opt-in basis in Brazil (with Oi and Telefónica) and Romania (with Romtelecom).(see http://www.techdirt.com/articles/20111103/10133616623/phorm-still-looking-large-scale-deployment-still-finding-investors.shtml)

[74]   http://support.verizonwireless.com/support/faqs/AccountManagement/verizon-selects.html

also use third parties such as market research companies and analytics specialists to improve the quality of customer data analysis and the insights that they are able to derive from the data.

For the avoidance of doubt, we have considered the mobile app ecosystem, which is a major source and user of customer data, as part of the online sector. We consider it in this section only to the extent that operators may use apps themselves, for example to support targeted advertising or to collect customer data.

For further details on the value chain, the nature of the data collected and the business models adopted in the telecoms sectors, please refer to Annex D.

4.2 Business models in the telecoms sectors that rely on customer data

4.2.1 Operational improvements: network management and micro-segmentation

Operators use a wealth of data to run operations, both for network optimisation and for marketing. With advances in IT systems[75] and computational power, it is now possible for operators to extend this use of data to real-time customer data, as well as very granular historical data stored in their systems. According to a survey conducted in 2012, most UK operators adopt customer-centric data business models.[76] The goals of such internal uses of online customer data are two-fold: improving sales and marketing, and managing network capacity more efficiently.

Use of customer data to improve marketing and sales

Analysis of data patterns and correlation can help improve the understanding of what customers value most, which in turn provides very valuable information on how to package, price and sell services.

By understanding its customers more granularly, an operator is better able to segment customers and develop customised propositions. Micro-segmentation has been used by many operators to help increase customer loyalty, attract new customers, increase ARPU and improve the effectiveness of marketing campaigns, cross-selling and upselling. Note that although many operators have deployed solutions to enable them to micro-segment customers, or are in the process of doing so, most do not announce this fact publicly, in part because they see these systems as strategic assets. However, we are aware of a number of operators that have developed such solutions, including O$_2$ in the UK, DTAC (Thailand), Telenor (Pakistan), Verizon (USA) and Vivo (Brazil).[77]

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[75]   Particularly OSS and BSS – see glossary for a definition of these terms.

[76]   The survey found that 66% of operators surveyed had such models in place; source: *Analytics: The real-world use of big data, a collaborative research study by the IBM Institute for Business Value and the Saïd Business School at the University of Oxford*, IBM 2012, www-935.ibm.com/services/multimedia/Anaytics.pdf

[77]   http://www.nationmultimedia.com/home/DTAC-fine-tunes-its-marketing-strategy-30119832.html
http://www.teradata.com/case-studies/The-Case-for-Subscriber-Analytics

Use of customer data to improve network management

The analysis of network utilisation data provides insight into what services and types of customers are responsible for driving demand for network capacity, and therefore costs. If operators are unable to manage heavy network loads effectively, congestion increases, lowering the speed of most online applications and therefore lowering the quality of service for a wide range of users. This results in complaints from customers and, in the worst cases, increased customer churn. To ensure that this risk is minimised, operators use detectors within their networks to collect and process signalling and session data, which provides real-time visibility of performance and can be used to ensure the network is performing effectively. Moreover, traffic management tools relying on 'deep packet inspection' can be used to adapt the service delivered to customers based on the nature of their subscription and the applications they are using.[78]

Potential impact on operators' businesses

The benefit that operators can get from using customer data internally in an effective manner is a competitive advantage. In a mature market such as the UK, the main mechanism through which this competitive advantage can manifest itself is higher market share, from additional customer acquisition and reduced churn.

Although operators that have deployed such solutions may gain a competitive advantage over competitors that have not, we expect that this advantage is likely to be short-lived, as all the operators in the market will eventually develop similar capabilities. If all operators deploy similar solutions in order to improve quality of service, or to personalise services through micro-segmentation, the initial competitive advantage will progressively disappear. Nevertheless, churn reductions could be more permanent.

To understand how much customer retention is worth to an operator like O_2, illustratively, we may consider the revenue at risk from its annual churners; we estimate this at around GBP720 million per annum, based on total revenues of GBP7.2 billion and assuming a churn rate of 10% per year. At the same time, we estimate that its acquisition and retention costs represent 10%–15% of revenues, i.e. between GBP700 million and GBP1 billion annually.[79] Therefore a modest 10% reduction in churn and a corresponding 10% reduction in acquisition and retention costs could improve the operator's margins by around GBP150 million per annum, an increase of 2pp in EBITDA.[80]

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http://www.sas.com/success/verizon.html
http://www-935.ibm.com/services/multimedia/Anaytics.pdf

[78] For example, Plusnet prioritises different types of traffic depending on the package that a customer is signed up to (Plusnet's Essentials package delivers peer to peer traffic on a best efforts basis (lowest priority), whereas customers on its Pro Add-on get a 'gold' service for peer-to-peer traffic (second highest priority)). See http://www.plus.net/support/broadband/speed_guide/traffic_management.shtml

[79] The figures in this paragraph are Analysys Mason estimates based on Telefónica's 2012 annual report.

[80] EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization – a commonly used measure of a company's profitability.

Please see Annex D for an illustration of the value chain, and for details about some of the OSS and BSS vendors that support operational improvements.

Case study 4.1: O$_2$ UK[81]

O$_2$ is the UK's second largest mobile network operator by market share, with approximately 24 million subscribers (over 30% of the market).[82] O$_2$ uses call usage, data usage, data from devices used by subscribers and other information to segment its customers. For example, it has used micro-segmentation to identify the pre-paid subscribers who are most likely to churn, and to implement a targeted inbound and outbound marketing campaign to persuade them to stay with O$_2$.

During this campaign, HTK Horizon helped O$_2$ to target 225 000 subscribers who had been identified as at risk of leaving the network, using SMS and interactive voice response (IVR) to promote a tariff add-on.[83] Of these targeted subscribers, 61 000 were retained during a three-month period.

4.2.2 Targeted advertising on operators' websites

Operators drive traffic onto their websites and applications by increasingly using these online properties as portals for new sales, contract renewal, self-service customer support, management and payment of bills, operator-run email applications, or unique content such as questionnaires, news articles and multimedia messages.[84] In many respects, the operator acts the same as any other online publisher, and has an opportunity to generate revenues through the insertion of online advertising including targeted advertising. Operators are unique, however, in their ability to drive online traffic to their websites and apps by making services available on their websites to their core customer base.

All operators have an online presence of some sort, but the importance of these properties varies to a large degree. Larger operators have stronger brands, which they can use to attract customers to their websites. For example, in the list of most visited sites in the UK, Sky.com ranks at number 33 with around 8.2 million unique visitors per month,[85] and BT.com at number 34.[86] BT.com and Sky.com both have unique news and entertainment content, and operate their own email platform. Interestingly, the mobile operators' sites are significantly less popular, receiving between one and two million unique visitors a month.

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[81]   http://www.o2.co.uk/

[82]   Source: Telefónica quarterly reporting, Analysys Mason estimates

[83]   http://www.htkhorizon.com/sites/default/files/clients/case_study/HTK%20Horizon%20Case%20Study%20-%20Telefónica%20O2%20UK.pdf

[84]   For example, Vodafone's MMS delivery is essentially done through a website.

[85]   Source: http://websitetrafficspy.com/

[86]   VirginMedia.com is ranked number 47 and TalkTalk.co.uk number 127

It is also important to put the revenue from advertising on these websites into perspective. Sky has annual revenues in excess of GBP7 billion, but the estimated annual revenue from its website traffic is just GBP1.2 million,[87] a very small proportion of its total income.

There is a final nuance in the approach to delivering targeted ads online by mobile operators, in that they can preinstall software on handsets that they distribute, typically bundled with a subscription. This provides the operators with a pre-installed tool that can display ads on these devices. For example, Sprint partnered with Samsung to install a toolbar on Android devices which enables the operator to serve ads at the bottom of the screens.[88]

Please see Annex D for further details, including for example the use of online properties to sell advertising by operators outside the UK.

Case study 4.2: BT.com

BT's core retail business is the provision of telephony, broadband and TV services. In support of this business, BT also operates BT.com, the 34th most popular website in the UK,[89] which includes news and entertainment reports, as well BT's Internet email platform. The site also offers customer support, and a "My BT" sub-site which users must log in to engage with.

BT uses three business models to monetise customer data: (a) targeted online advertising (both on its own website and the sites of third-party publishers); (b) operational improvements (cross-selling, up-selling and technical improvement); and (c) the sale of user data.

BT.com operates a simple cookie-based mechanism which allows customers to control how their data is used, by moving a slider to one of three positions; "strictly necessary & performance", "functional" and "targeting". This provides the user with a large amount of control. The cookies are used to collect and store data, which allows third parties to target BT's users, and BT to target potential customers on other websites.

BT earns revenue from targeted advertising on a CPM basis, in the same way as other publishers. It also pays other websites on a CPM basis to advertise its own products.

4.2.3 Targeted advertising via messaging (targeted messaging)

Marketers can buy SMSs from operators or specialist bulk SMS wholesalers in order to deliver targeted messaging. E-commerce companies also use SMS for retargeting, in much the same way as they use email and targeted online ads to bring consumers back onto their website. Some operators have developed a business model that adds value to the low-margin sale of bulk SMSs

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[87]   Source: websitetrafficspy.com

[88]   http://www.adexchanger.com/mobile/sprints-pinsight-media-explores-native-ad-units/

[89]   http://www.alexa.com/siteinfo/bt.com

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by enabling marketers to deliver targeted SMSs, without the marketer having to collect data and opt-ins from mobile users.

In order to collect customer data, some operators also offer users the opportunity to sign up to special offers and information from marketing partners; an example of this is O_2 More.[90] At the time when an operator asks customers for personal information, it may ask them where they live, the music they listen to, what sports they watch, and so on. This information can be used to develop targeted SMS campaigns on behalf of marketers.

Marketers use a mobile operator to deliver targeted messaging using one of two approaches. First, messages can be delivered to a particular target group (e.g. customers who are likely to be interested in holidays within the UK). The second approach is to target customers based on their location (sometimes known as *geo-fencing*) – for example, an SMS could be sent when someone comes within a set distance of a store.

In some cases a marketer may use an agency to liaise and manage a targeted SMS campaign on its behalf. For example, Starcom managed a campaign on behalf of Pizza Hut in which O_2 delivered SMSs that offered promotional offers when consumers were within half a mile of one of the company's outlets.[91]

Through these approaches, mobile operators are able to monetise information about users, including real-time location information. In order to maximise the value of this service to marketers, EE, O_2 and Vodafone (who account for over 90% of UK mobile users)[92] are collaborating in a joint venture called Weve which offers bulk SMSs to clients wishing to target customers of all three operators.

SMS advertising tends to be more prevalent in less developed countries,[93] although the campaigns are often not targeted. In the UK, SMS-based advertising is relatively uncommon, but the success of targeted SMSs in being able to deliver additional sales to marketers means they are likely to continue to be used. According to secondary sources, the SMS campaign for Pizza Hut was far more effective at achieving sales than TV and online marketing. It is our understanding that Weve plans to extend this model outside the UK and Europe.[94]

We estimate that by facilitating targeted messaging, an operator is able to add a margin of between 10% and 20% on top of the sale of SMSs on a wholesale basis. Overall, however, this is likely to

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[90]   http://www.o2more.co.uk/FAQs

[91]   http://provenstratgz.wordpress.com/2012/06/07/pizza-hut-mobile-campaign-4-4-times-more-ffective-than-tv-mobile-marketing/

[92]   Source: Analysys Mason Research

[93]   In Kenya, SMS advertising is very common. Adverts are attached to balance enquires from the network operator, and unsolicited SMS messages are common.

[94]   http://www.marketingweek.co.uk/news/mobile-operators-to-extend-weve-outside-europe/4005850.article

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remain a small incremental source of revenue for operators, rather than a significant means to compensate for pressures on prices and service revenue.

Please see Annex D for details of the value chain for targeted messaging, the major market participants, and the drivers of this business model.

Case study 4.3: Weve[95]

Weve is a joint venture by O$_2$ (Telefónica), EE (Orange and T-Mobile) and Vodafone, which began in late 2012. It provides a common platform for mobile advertising, payments and loyalty schemes. The operators involved represent over 80% of the UK's mobile customer base, so Weve can deliver targeted SMSs to most of the UK population. The company works directly with advertisers, and also with intermediaries such as The7stars.[96]

Weve is able to deliver SMSs to consumers based on a number of attributes, including location, gender, age, income and interests. For example, in July 2013, Virgin EMI sent animated MMSs to 100 000 dance music fans to promote a single: data on the location where the fans were likely to have heard the single was cross-referenced with demographic and behavioural data in order to determine to whom to send the SMSs. The company is currently developing display advertising and NFC-based loyalty services.

Weve operates a revenue-sharing agreement with the three partner operators, based on the relative numbers of customers that each operator delivers to the messaging platform.

4.2.4 Advertising network integration

We are only aware of two mobile operators in the world that have integrated or developed infomediary services in order to deliver targeted online ads to mobile devices in a major way; neither of them is based in the UK. Sprint provides infomediary services through Pinsight Media+,[97] and SingTel does so through Amobee, which it acquired in 2012.[98] Their approaches are slightly different, a direct result of how they entered the market for targeted mobile online display advertising.

Amobee provides targeted ad services to advertisers and publishers in the same way as other infomediaries, but specifically to mobile users. Through SingTel, Amobee has access to a large user base in the countries in which SingTel operates, giving it two main competitive benefits: (a) it is able to deliver targeted ads to these users using a range of techniques including geofencing; and (b) it can

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[95]   http://weve.com/

[96]   http://www.the7stars.co.uk/#!/

[97]   http://newsroom.sprint.com/news-releases/sprint-launches-pinsight-media-advertising-service.htm

[98]   http://www.amobee.com

collect a broad range of first-party data on SingTel's mobile network (e.g. behavioural data collected from mobile apps) and combine it with personal data already held by the operator.

Sprint's offering is somewhat different, since its infomediary services are only available to publishers (specifically app developers) and advertisers, and not to other mobile operators.

In the UK, the only visible initiative that may in the future follow this type of model is Weve (discussed above), which is understood to be launching an online targeted ad service for ads to mobile users as an extension to its targeted-messaging capability.[99]

Any operator that develops an advertising network will have to compete with other infomediaries that already provide the same services to publishers and advertisers. This is a significant challenge for operators unless they buy in the expertise (as SingTel did by acquiring Amobee), as it is difficult to gain credibility in the market and attract publishers and advertisers.

Please see Annex D for an illustration of the advertising network value chain, and for further details about Amobee's targeted ad business model.

Case study 4.4: Sprint Pinsight Media+ [100]

Pinsight Media+ is an infomediary and advertising intermediary owned by Sprint (a USA-based mobile operator), which enables advertisers to deliver ads directly to Sprint's mobile subscribers.[101] Pinsight installs a toolbar on Sprint Android devices which sits on top of the browser. This Lumen toolbar, developed by Skyfire, collects behavioural information which can be cross-referenced with aggregated and pseudonymised customer data collected by Sprint, in order to deliver targeted ads to subscribers. The toolbar provides advertisers with the opportunity to serve targeted ads at the bottom of the screen. An advertiser can also sponsor a button on the toolbar, or buttons selected by the user. Pinsight also enables app developers to install a software development kit (SDK) in their apps which facilitates the collection of behavioural data and the delivery of targeted ads, in order to sell ad inventory.

Pinsight can only provide its targeted ad service to subscriber devices on which a Lumen toolbar has been installed. At the time of launch, Lumen was being installed on Samsung Galaxy S4 devices, and subsequently was available on other Android devices.

Pinsight earns revenue from app developers on a revenue-sharing basis, as well from targeted advertising provided on behalf of advertisers and advertising intermediaries.

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[99]   http://www.marketingweek.co.uk/news/weve-primes-display-ad-services/4007599.article

[100]   http://pinsightmedia.com/

[101]   http://newsroom.sprint.com/news-releases/sprint-announces-lumen-toolbar-featuring-unparalleled-discoverability-for-developers-and-reach-for-brand-advertisers.htm

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4.2.5 Packaging and sale of customer insights

As mentioned previously, fixed and mobile operators collect a wide range of data in order to deliver services. Of the models outlined above, it is clear that the internal use of data is most important; external uses linked to advertising only bring marginal benefits. One area where some operators have been experimenting further, however, involves real-time location data that is collected by mobile networks as part of day-to-day operations. An early example of a service making use of extensive real-time location data is Telefónica's Smart Steps programme,[102] which offers retailers the ability to understand footfall in their shops based on mobile phone location and associated data.

The operator can combine this location data with other data it holds, plus third-party data provided by data aggregators. This can lead to better insights, for example regarding what sorts of customers visit specific shops. In making use of this data, operators must ensure that it is appropriately anonymised or pseudonymised.[103] Provided this is adhered to, there is no requirement for specific and explicit customer consent.[104] EE has a partnership with Ipsos MORI and is seeking to develop a business model similar to Telefónica's Smart Steps initiative.[105] Our interviews suggest that many other operators are also planning similar programmes.

It should be noted that operators are not the only market participants that can collect location data about mobile users: Google collects location data from GPS and Wi-Fi networks, though users can opt out of providing such data. Further, in November 2013, Google started to beta test a solution to collect location data from Android devices, which is thought to help it to deliver targeted advertising on behalf of clients rather than to operate the business model described here.[106] Facebook is not yet able to provide a similar service to those provided by operators because users need to physically check in, which is not automatic. It has now entered into a venture with Cisco in order to collect more location information through the provision of free access to public Wi-Fi hotspots when the user signs in using a Facebook log-in.[107]

Outside the UK, Verizon Wireless (USA) and Orange (France) are also using aggregated location data to provide services to clients,[108] and Telefónica is thought to be in the process of launching Smart Steps across its international footprint. It should be noted that in Germany Telefónica discontinued Smart Steps following user backlash and concern expressed by the government about privacy.[109] Even though operators are legally permitted to collect and use location data in an

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[102]   http://dynamicinsights.Telefónica.com/488/smart-steps

[103]   http://europa.eu/legislation_summaries/information_society/legislative_framework/l24120_en.htm

[104]   From http://www.bbc.co.uk/news/technology-19882647; "So long as individual's personal information cannot be identified from this service, we don't have any problem with it."

[105]   https://explore.ee.co.uk/our-company/newsroom/ee-and-personal-information

[106]   http://androidcommunity.com/google-beta-testing-program-for-location-based-advertising-sales-20131111/

[107]   http://adage.com/article/datadriven-marketing/facebook-cisco-partner-ambitious-play-local-dollars/244527/

[108]   http://adage.com/article/dataworks/verizon-phone-data-connect-dots-nba-sponsors/245178/
    http://www.transport-intelligent.net/IMG/pdf/traficZen-view-php-1.pdf

[109]   http://www.fiercewireless.com/europe/story/telef-nicas-big-data-plans-blocked-german-regulator/2012-11-02

aggregated form, it is likely that Telefónica did not want to risk damaging its core business by upsetting subscribers who were not happy with their data being used, even in this form.

The sale of customer insights and analytics is unlikely to deliver significant revenue streams for operators. In Telefónica's case, it anticipates generating EUR1 billion (GBP0.86 billion) worldwide between 2012 and 2015 from mobile payments, rewards, offers, advertising and the sale of customer insights and analytics.[110] This total amount – of which revenue derived from location data is only a small proportion – represents less than 0.5% of its overall revenue during the same period.[111]

Please see Annex D for an illustration of the value chain related to this business model, and for further details about the value that operators can add to location data.

Case study 4.5: Telefónica's Smart Steps programme[112]

Telefónica launched Smart Steps in the UK through its Dynamic Insights division in late 2012. Smart Steps is a 'crowd analytics' platform that uses anonymous aggregated information about subscribers to deliver valuable footfall data to retailers and public bodies.

Smart Steps has worked on behalf of the UK supermarket Morrisons to identify people who currently do not visit their stores, but who could be prime targets.[113] Smart Steps was able to identify postcodes of people to send vouchers to by tracking the movement of Telefónica's subscribers from Morrison stores to different postcodes. The target addresses were filtered to exclude existing customers of Morrisons and people who live close to competitors' stores.

Telefónica offers two pricing models: access to aggregated data for an annual fee, and a managed service in which the operator provides service and support on a bespoke or project basis.

4.3 Future growth: prospects and potential barriers

Currently, the most significant and widescale use of customer data by operators is for operational improvements, principally for network management and micro-segmentation of their customer bases, enabling them to enhance quality of service, drive up revenue and improve margins. These uses of customer data are highly likely to continue, and operators in the UK and elsewhere are investing heavily in network and IT systems that enable more sophisticated uses of customer data for these purposes.

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[110]   http://www.Telefónica.com/en/shareholders_investors/html/presentaciones/confinversores_digital_2012.shtml

[111]   Analysys Mason estimate 2012 to 2015 based on Telefónica's global revenue for 2012 of EUR62 billion (GBP53.3 billion).

[112]   http://dynamicinsights.telefonica.com/488/smart-steps

[113]   http://blog.digital.Telefónica.com/?press-release=smart-steps-morrisons

Business models focused on new revenue opportunities are beginning to emerge, but have yet to be used extensively. Some operators are considering models that enable them to act as infomediaries or advertising intermediaries, serving targeted ads or messaging to their customers. However, in this space they will have to compete head-to-head with many players that already have well-established businesses in the online market; this is not an easy task, and many operators do not have the capabilities to develop new data-led business models. On the whole, the role that operators can play in the online advertising value chain is in our view quite limited, because most advertising is delivered over the top through web pages and applications.

The stakeholders we have interviewed have indicated that operators are comfortable with the existing legal framework surrounding customer data usage. They are particularly aware of the differences in customers' approaches to the data they entrust telecoms operators, which they see as essentially privileged information, compared to the data they share online. For example, the Sunday Times reported in May 2013 that EE and Ipsos MORI were selling individuals' personal data. Although it appears that this story was not true, it was picked up by many news organisations and resulted in both companies issuing statements to try and mitigate the damage to their reputations.[114]

The negative reactions of customers can be so severe that operators have had to discontinue a business model that was using customer data, as with Telefónica's Smart Steps service in Germany. It is clear that if operators are to monetise customer data, they need to consider how best to inform customers on matters such as how the data will be used and how customers may benefit.

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[114] http://www.ipsos-mori.com/newsevents/latestnews/1390/Ipsos-MORI-response-to-the-Sunday-Times.aspx

5   Use of customer data by the postal sector

The postal sector has traditionally been an important intermediary in the *offline* customer data space, but has limited opportunities in the *online* space

Within the postal sector the focus of customer data remains very much on offline sources. Royal Mail maintains a database of residential and business names and addresses, which in the UK today represents over 29 million properties.[115] The data is updated on a daily basis by postal employees who physically visit each of the addresses along their delivery routes. This creates a very accurate and valuable dataset in what is a constantly changing environment.[116] In the UK, there are over 37 000 licensed users of the data, the vast majority of whom are outside the postal sector.

The business models related to online customer data within the postal sector are relatively simple and appear to rely primarily on the combination of offline address data with online customer data such as age, gender, income, job type, housing type or e-commerce behaviour.

As an example, in 2010, Royal Mail partnered with eBay to develop its Insight Tool, which merged the company's offline address data with transaction data from eBay to create a detailed dataset on spending habits that makes it easier for advertisers to reach their intended audience. Despite the value added by merging with additional online data in this way, most postal operators still advertise their data services primarily on their ability to provide up-to-date address data.

Nor do postal operators appear to be actively collecting behavioural data (such as mail or parcel volumes or origins for each address) alongside their address data. Whilst this data could conceivably be collected, packaged and sold, the potential backlash from consumers (who would have little opportunity to opt out) makes such a move somewhat unlikely.

Because of the limited developments in this sector, we have not considered it in detail in this study.

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[115]   http://www.poweredbypaf.com/end-user/products/data-products/paf-raw-data/

[116]   In the UK, 12% of the population move houses, 512 000 people die, and 75 000 businesses relocate each year.

6 Policy and regulatory challenges related to customer data

This section, building upon the research and interviews conducted as part of this study, highlights policy-related findings and trends that are common across the five sectors considered. We then assess possible scenarios for the future use of online customer data, before providing our overall conclusions.

6.1 Policy-related findings and common trends across sectors

6.1.1 Trends and findings in the UK

A number of common patterns have emerged across all the sectors, which we discuss below under the headings of innovation, consumer protection and competition.

Innovation

The ability to collect, store, exchange, analyse and use customer and user data has spurred a wide range of innovations. This is particularly visible in the online sector, but is also key to the efficiency improvements that telecoms operators are making thanks to better analysis of their customers' behaviours and preferences.

Some of these innovations are essentially efficiency improvements, which in the first instance benefit the companies themselves, before filtering through to their customers, and to consumers generally. In this group we include targeted advertising, retargeting and network optimisation. Other innovations are entirely new features or services; examples here include personalised recommendations, 'digital assistant' services, and targeted offers based on micro-segmentation.

One concern that is widely shared among our interviewees is the effect that a more restrictive regulatory regime would have on new service innovation, and also on the large number of specialised businesses (ad intermediaries and infomediaries, for example) which have developed to take advantage of the opportunity to innovate with customer data.

Consumer protection and control

The second consideration relates to consumer protection in a wide sense. This is the chief preoccupation of data protection policy and regulation in the UK and other developed countries, but is an extraordinarily complex area. Here, we discuss the issues from the point of view of the sectors under consideration in this report. There appears to be a view in all sectors that consumers can 'vote with their feet' if they feel their data is not being appropriately protected or used. In the telecoms industry, for instance, operators are very wary of using customer data for external uses (as opposed to internal uses such as efficiency improvements), following high-profile cases such as that of Phorm in the UK and the response in Germany to Telefónica's Smart Steps programme.

Subscribers are also reluctant to be contacted on their mobile devices for promotional purposes.[117] In the online industry, likewise, infomediaries have developed approaches designed to help companies ensure regulatory compliance and best practice in the use of customer data.

Consumers' choice on the use of their data depends, however, on there being sufficient information available for this choice to be well informed, and sufficient flexibility so that consumers who are unwilling to share their personal data are still able to enjoy most of the benefits of online services. Several interviewees mentioned the 'cookies directive' (e-Privacy Directive 2012)[118] as an example of irrelevant regulation, arguing that it is both ineffective (consumers have not stopped using sites that use cookies) and unenforceable (as illustrated by the website http://nocookielaw.com/, whose purpose is to demonstrate the lack of enforcement of the Directive). We would argue, however, that the obligation for sites to disclose their use of cookies contributes to a progressively greater understanding of how data is collected online from consumers.

Likewise, some sources indicate that do-not-track (DNT) and ad-blocking technology are being adopted more and more widely,[119] suggesting that a significant and growing minority of consumers are taking measures to protect their privacy, quite independently of any regulated obligation being imposed on the collection, transfer or use of their data.

In this context, interesting initiatives are emerging online to provide users with more control over their data and the advertising they are served. For example, the AdChoice[120] industry initiative purports to provide clear information and control to users – the retargeting specialist Criteo offers particularly granular choices.[121] The BT.com website is also an interesting case study, as it allows users to move very easily from an open regime in which their data is collected and used broadly, to a closed regime where no targeting is possible. The risk of a significant move by consumers towards ad blocking is an important motivation for the industry to provide by default the information and control that policy-makers would like to see.

These initiatives by industry are occurring against the background of the proposed EU General Data Protection Regulation (GDPR or DPR), which would have to be enforced in all EU Member States. There are robust discussions of the DPR taking place throughout Europe, with widely varying views and approaches being expressed. The gap between the current DPR proposals and the position of the UK government illustrates that there is no consensus, either on what data protection policies should achieve, how they could work in practice, what their enforcement would imply, or what their broader impact might be.

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[117] Although the UK based MVNO Blyk was designed around a model of such interaction, it is no longer in operation; more recently Ovivo is trying a similar strategy

[118] See for instance http://www.ico.org.uk/for_organisations/privacy_and_electronic_communications/the_guide/cookies

[119] See for example http://blog.pagefair.com/2013/the-rise-of-adblocking/

[120] http://www.youradchoices.com/

[121] http://www.criteo.com/en/privacy-policy

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Interestingly, at the same time as the online sector matures and appears to be developing industry-led measures that support increased consumer control, in the newer world of connected TVs and games consoles significant privacy concerns are coming to light. A recent controversy involving LG's smart TVs (see Annex C.3), highlighted the potential for TVs to collect and send a large amount of customer data over the Internet. Likewise the new Xbox One comes bundled with a Kinect device that can monitor and record movements and sound, and potentially transfer them.[122] Similar concerns have been raised in the past regarding built-in webcams, but consumers often do not see new devices such as smart TVs and games consoles as being computers, and they may not be aware that such devices have capabilities that can give rise to the same sorts of problems. These capabilities represent a new challenge in consumer protection, linked with the increased connectedness of everyday devices that consumers do not associate with Internet browsing.

Competition and contestability

A last consideration that we see as very important is the ability of the market to support competition and contestability,[123] ultimately to the benefit of consumers. The current wide availability of customer data, both on a first-party and on a third-party basis, is enabling new entrants to experiment and develop new propositions with limited barriers to entry associated with customer data. If the availability of data is reduced as a result of regulation or consumer opposition, players with the large existing amounts of customer data and the ability to collect more data through established customer bases may be able to entrench their position.

Likewise, established online companies with a large market share (such as Google in search or Amazon in e-commerce) retain a significant incentive to keep innovating in order to increase 'stickiness' of their user base. Increased barriers to entry for new players (or barriers to expansion for existing players) might lead to further entrenched market power.

6.1.2 International perspective

The themes described above (innovation, consumer protection and competition) appear to be shared across all developed markets, which have all adopted reasonably similar approaches to data protection and privacy in practice. In France, for example, there are clear principles on how the e-Privacy Directive should be implemented, but these imply a lot of flexibility for publishers, similar to what the ICO is recommending in the UK.[124] Also in France, a court has ruled that IP addresses do not constitute personal data. In the UK there is a lack of clarity on this issue, as mentioned by several interviewees, but this has not led to a functionally different outcome: in practice, IP addresses are used when necessary as non-personal data, without a strong threat of action from the ICO.

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[122] http://bgr.com/2013/11/04/microsoft-xbox-one-kinect-privacy-statement/

[123] A highly contestable market is one that has low barriers to the entry of new players, and vice versa

[124] http://www.cnil.fr/documentation/fiches-pratiques/fiche/article/ce-que-le-paquet-telecom-change-pour-les-cookies/

Sometimes similar regulatory regimes can foster different outcomes. For example, even though the regimes in Germany and the UK are substantially similar, the Telefónica Smart Steps programme was blocked by the German data protection authority, despite being allowed in the UK. Nevertheless, even though each country has its own regime, and approaches to specific issues are sometimes different, the general practice of data protection, the approach to enforcement and the resulting outcomes do not seem particularly divergent within large EU Member States such as the UK, France and Germany.

In the USA, the regulatory approach is to focus on enforcement by the Federal Trade Commission in case of complaint (based on general consumer protection in trade), rather than compliance with specific data protection rules. Despite this difference in approach, the USA does not appear to be an easier or harder market in which to operate when using customer data.[125]

6.2 Scenarios for future developments

In order to examine the impact of the trends identified in this study, and the issues they raise in terms of innovation, competition and consumer protection, we considered three scenarios:

- Status Quo scenario – The current state of play, with the trends and dynamics that we have identified and discussed throughout this report continuing as they are today. In this scenario there is no fundamental change to the policy framework or its enforcement, and the current market dynamics play out in an evolutionary way.

- Restricted Growth scenario – A situation where customer data usage is scaled down from the current situation as the result of evolutions linked to market forces (e.g. as the result of some particular campaign on privacy issues) and/or policies limiting the use of customer data.

- Explosive Growth scenario – A development in which customer data is used on a much wider scale than at present. This would possibly require a more liberal policy regime than is currently in place, as well as a broad degree of acceptance from consumers and an increased need for customer data in the market.

In the sections below, we discuss each of these scenarios and the policy changes and market dynamics that underpin them. We also consider their implications in terms of industry development and innovation, competition and consumer protection. Further details are provided in Annex E.

6.2.1 Status Quo scenario

In this scenario, we consider a regulatory and market environment similar to the one prevalent today.

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[125]   Based on interviews with industry stakeholders active in both markets

Description of the scenario

In this scenario collection of data remains straightforward on a first-party basis, and the current approach used for cookies remains unchanged: using a service implies consent within a privacy policy chosen by the data controller within the limits set by current legislation and regulations. Third-party collection of data becomes increasingly visible to customers, who can choose to block it. Transfer of non-personal data, either anonymised or pseudonymised, remains possible and incurs limited transaction or compliance costs, whilst transfer of personal data can also be done provided appropriate consent is obtained.

Repurposing and recombination of data is not limited for anonymised data, and effectively is possible for pseudonymous data under a limited requirement to ensure that individuals cannot be identified as a result. For data controllers, repurposing and recombination of personal data is also possible, with limited requirements to obtain specific consent, as long as the new purpose is consistent with the original disclosure and consent provided by customers when the data was first collected.

In such a scenario there will be no fundamental rejection by consumers of the current way in which their data is collected and used. It is likely, however, that consumers will become more selective in how they allow third-party data collection to take place, through the increasing use of do-not-track measures such as third-party cookie blocking. It is likely that ad blocking technology will remain available and will be increasingly used, though not to the extent that it undermines continued, albeit slowing, growth in the use of online advertising. The increased demand for mobile apps will enable publishers and advertisers to mitigate the use of ad blocking, as consumer control of advertising will be more difficult to implement within applications (or will be expressly monetised by charging a premium for apps free of ads).

Implications

Under this scenario, the current pace of innovation driven by the use of customer data would likely to be sustained in all sectors. Personalisation on the basis of large data sets would probably become increasingly common, fuelled by more sophisticated types of data (e.g. from wearable technology). As viewing of traditional long-form content online develops further, broadcasters may make increasing use of customer data and targeted advertising, whilst innovative developments in TV devices (smart TVs and set-top boxes) could provide environments in which recommendations and targeted advertising can grow.

In this scenario we do not expect major changes to the way in which consumers approach their privacy, but awareness of the fact that a range of first and third parties collect and use their data will foster a more informed approach to privacy, including for example wider use of privacy-enhancing technology such as cookie blocking and DNT.

We expect data to remain widely available under this scenario, despite a probable reduction in the ability of third parties to collect as much data as they do presently (at least from certain groups of

consumers). This may give rise to slightly higher barriers to entry for data-intensive business models, but only to the extent that consumers become more selective in whom they entrust their data with.

Conclusions

This scenario strikes a balance between ensuring consumers are informed and protected, and allowing customer data to continue fuelling innovation and supporting development of the online industry.

6.2.2 Restricted Growth scenario

In this scenario, we consider a regulatory and market environment that is materially more hostile to the use of customer data.

Description of the scenario

Collection of data becomes harder for both first and third parties, either because regulation requires explicit consent to be provided for a wider range of data, or because of a more generalised rejection by consumers of cookies and other forms of tracking technology. Faced with a choice between collecting less data or losing traffic, web publishers would be likely to choose the former.

Transfer of anonymised data would remain possible, still with limited transaction or compliance costs, whilst transfer of both personal and pseudonymised data could only be done under more stringent disclosure and consent requirements, resulting in substantial reductions in the availability of this type of data.

Repurposing and recombination would also be negatively affected, both through a reduction in the scale and scope of the data available, and because of the more explicit consent requirements that must be obtained from customers. First parties could still use the data provided by their customers broadly, but they would be effectively incentivised to hoard this data, creating scarcity in the market as a whole.

This scenario could come about because of a fundamental rejection by consumers of the way in which their data is currently collected and used. This may translate into much more widespread blocking of cookies, both first- and third-party, as well as the rejection of sites and mobile apps that are perceived as requiring too much data without a clear rationale. Stricter policies by major app stores might play a role.

Implications

Under this scenario, the increased scarcity of data would be likely to reduce the ability of players to innovate. In particular, in the online sector, it might significantly increase barriers to entry for new players, and concentrate the ability to collect data to established first parties (e.g. Amazon or

Google). Such a reduction in innovation in the online sector might, however, benefit traditional players in the audio-visual and telecoms sectors by reducing the threats that they face from OTT competitors.

This scenario could result from consumers having more control over their data, and choosing to exercise this control in an informed and effective way. The level of perceived privacy would increase, as would the incentives for data controllers to protect customer data very closely. However, in other ways consumers may be harmed, for example by a reduction in innovation and reduced funding opportunities for niche content.[126]

In this scenario, customer data would become scarcer, and the collection and use of that data would be subject to increased 'frictions', for example if explicit consent was required to collect and use a broader range of data. In this context, established companies would benefit at the expense of new entrants, by being able to demonstrate that collection of customer data is either necessary to deliver a service, or the counterpart of a service that consumers value sufficiently highly (in other words, constitutes a form of payment for the service). This has important implications:

- Justifying the collection of data on the grounds of its intended use may not always be possible. Innovation related to data happens through experimentation, and is sometimes the result of serendipity rather than explicit design. In particular, with advances in computational power and algorithms, it is now possible to experiment on extremely large datasets, often in real time. This makes personal or pseudonymous data valuable, as long as it can be used without excessive frictions – but these are likely to arise in this scenario.

- Scale becomes essential if data is scarce and difficult to collect or transfer. The ability to analyse large datasets is critical to a number of innovations, for example those associated with machine learning or crowd-based analyses (e.g. traffic data on Google Maps). If pseudonymous data cannot be easily exchanged, combined and repurposed, only companies with large pre-existing datasets and customer bases will have full opportunities to innovate, which is likely to lead to further vertical integration, and large businesses becoming larger still.

Conclusions

This scenario would significantly scale back some of the developments related to the use of customer data that can be observed today. In practice, these developments are often not directly visible to users, as they relate to the ability of intermediaries to increase the efficiency of service delivery, such as online advertising for example. Where they are visible is in the level of innovation, and the entry of a large number of new players, which would be hampered in this scenario.

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[126] For example if targeted advertising became more difficult, the ability of less-visited pages to sell advertising slots would be reduced, negatively affecting their business model and placing a higher premium on valuable content to attract visitors

From the perspective of broadcasters and telecoms operators, such a scenario may slightly reduce the threats they face, namely intermediation in the advertising value chain for broadcasters, and commoditisation for telecoms operators. This would, however, come at the expense of consumers' choice to consume services over the top and from a range of providers; potentially, detrimental longer-term effects may outweigh the benefits in these two particular sectors.

6.2.3 Explosive Growth scenario

In this scenario, we consider a regulatory and market environment materially more liberal as regards the use of customer data.

Description of the scenario

In practice, the current regime facilitates a broad range of activities, and liberalising it further would probably involve removing restrictions on the use and transfer of certain types of personal data. One possibility would be for non-sensitive personal data to be handled in a less restrictive way. Under this scenario, collection of data would become easier, with less stringent consent requirements for the collection of data (including background data as well as personal and behavioural information). In order for this to be feasible, consumers would have to be comfortable with such an increase in data collection; it is an interesting question whether this is more or less likely with a decrease in the amount and clarity of information provided to consumers about such practices.

Transfer of most types of data could be done without friction under a light, implied-consent regulatory regime. Transaction or compliance costs would reduce, and large amounts of personal or pseudonymous data would be available much more broadly. Personal data that enables the identification of individuals directly, possibly as opposed to indirectly through recombination with other types of data, could remain subject to restrictions substantially similar to those in force today. As a result, data-related barriers to entry would be low.

Repurposing and recombination would remain possible with limited restrictions, possibly including data that may enable the identification of individuals in combination with other data points. As a result, the level of privacy would likely to be significantly diminished in this scenario, while the range of activities that companies without established customer bases could undertake may expand significantly.

Loosening restrictions on the use of personal data would significantly weaken privacy controls, and general levels of data protection and security. In practice, this may be unacceptable from the perspective of consumers and policy-makers. We discuss below what this may imply, to assess whether potential gains may possibly outweigh the downsides.

Implications

Under this scenario, there would be no barriers to extensive innovation, thanks to the broad availability, at low cost, of substantial datasets, including detailed pseudonymous data. Availability of a wider range of types of data (made possible by narrowing the scope of what constitutes personal data) could possibly fuel further innovation, although there is no evidence that the current regime is preventing such innovation from emerging.

In practice, this scenario is only likely to come about if consumers are willing to share their personal data more broadly. If that was the case, telecoms operators might be less reticent about using their customers' data may subside, creating some new opportunities for them. However, if broader availability of data were to happen without consumers properly appreciating the consequences, in the longer term the perceived level of privacy and data security may decrease.

Without significant limitations to the availability of third-party data, the cost of entry will remain low or even reduce. Avenues for innovation will remain, and data will become less scarce than it is at present. We note, however, that with limited restrictions and costs associated with the use of data, some of these uses may be inefficient or groundless.

Conclusions

In this scenario, it is likely that there would be an appreciable reduction in the level of privacy and control enjoyed by consumers. If this were unacceptable to consumers, they might reduce their reliance on online services, introducing a kind of 'deadweight loss' as the benefits of online services cannot be fully realised.

6.3 Conclusions

In this report we have established that online customer data is used in a range of business models across the online, audio-visual and telecoms sectors, and to a much lesser extent in the postal sector. Innovation is widespread and rapid. Many specialised intermediaries have emerged, driving this innovation and providing specialised services in many parts of the value chain. These business models are part of a thriving ecosystem, but do not yet represent a huge amount of economic value. In fact, although rapid growth can be expected, it arises mostly through improving efficiency, for example by increasing the exposure and value of online ad inventory.

Specific threats exist, in particular for broadcasters, who need to adapt to the way in which advertising is delivered online, but on the whole online customer data provides many opportunities in the sectors considered: it underpins large parts of the Internet, it helps broadcasters to understand audiences better and develop more relevant content, and it supports operators' efficiency efforts from a network and marketing point of view.

Although consumer protection is a fundamental requirement in policy-making and regulation related to customer data, we believe the current regimes are able to address most of these concerns

while letting innovation develop, and leaving ample room of manoeuvre for non-personal data to be exchanged and used in many different ways.

This being said, it remains essential to ensure that consumers have the appropriate information to make reasoned decisions with regards to how their data is collected and used, and also that they are provided with the right tools to be able to make these choices without being excluded from services altogether.

The current policy and regulatory regime seeks to strike a balance, between a more liberal regime that could result in a substantial reduction in privacy and corresponding difficulties in ensuring data protection, and a tighter regime that could reduce innovation and create competition issues. Looking ahead, it will remain important to ensure that the trade-offs inherent to any significant change in approach (for example, the DPR) are assessed carefully.