Appendix E: ecosystems of Google and Facebook

Introduction

1.   In recent years, the most successful digital platforms have been building large ecosystems which have grown the range of their infrastructures, technologies, products and services. For the purposes of this report, we use the term 'ecosystem' as a broad descriptive term to encompass the various aspects of a platform's activities and services which interrelate and often complement or connect to a core service.

2.   An important characteristic of an ecosystem is the presence of complementarities and interdependencies between economic activities. In a platform ecosystem, these interdependencies can be heightened as the platform owner sets the architectural design of interfaces which determine how other products and services can interconnect. The platform firm also sets rules for participation in the ecosystem by third parties such as app developers, device manufacturers, advertisers and publishers, and decides how its design evolves over time. This position can enable the platform to expand into related markets, which can give rise to potential efficiencies, as well as concerns such as insulating its most profitable products from competition.

3.   After providing an overview of the role that ecosystems can play in supporting the development and sustainability of digital platforms, this appendix examines the ecosystems of Google's and Facebook's consumer facing products, and explores the links between the various components in each ecosystem, including external third parties and uses.

4.   This appendix is intended to offer a non-exhaustive snap-shot summary of the ecosystems that Google and Facebook have built around their core platform, in order to add background and context to our report. It is not intended to provide a history of the development of either platform, although some aspects of their evolution are examined at other points in the report, such as Appendices J and M. To illustrate the full extent of the reach of these companies' ecosystems, we have included a longer list of their products and services within Annexes A and B.

The importance of ecosystems

5.   Google and Facebook have each built extensive ecosystems, which include a range of products and services that are interdependent and complement one another, including their core platforms. Their presence across this range of

activities enables them to support their products through enhanced integrations and sharing of data across technologies.

6. These companies may have a differing set of objectives for developing their range of products and services and expanding the reach of their ecosystem. For example, they may be seeking to:

- strengthen their reputation and brand across a broader range of consumers;

- improve the service they are able to offer their customers for their existing services, by creating additional complementary services that enhance the user experience;

- achieve efficiency savings by integrating a number of services that have similar requirements for expertise, systems, and technology;

- increase the volume and variety of the data they collect and process about their consumers, with the aim of innovating and improving their services, as well as being to meet demand for valuable highly personalised advertising;

- diversify their business portfolio so that they are resilient to changes in social preferences and trends over time, or technological developments; and/or

- generate additional profits by succeeding in new or existing markets.

7. This strategy can undoubtedly deliver a number of benefits to consumers. First, providing a range of valuable services within a single platform's ecosystem, such as email, browsers and messenger apps, can increase the ease with which consumers can access such services, reducing the friction and hassle associated with multiple sign-ins and authentications, for example.

8. Second, by managing a range of connected services 'in-house' within one company, decisions around design can be taken in a strategic and consistent manner, to ensure that services are fully compatible and can interoperate seamlessly. Separate companies operating potentially complementary services may not have sufficient incentives to cooperate so effectively, or they may not feel able to be as open and transparent as is possible between two teams within the same company.

9. However, the presence and expansion of these digital ecosystems can also give rise to a number of competition concerns, as well as exacerbating other concerns we have regarding the gateway position that these platforms hold.

10.   First, platforms with market power can leverage their position into downstream or adjacent markets, giving themselves an advantage over potential competitors and undermining competition in those markets. We have heard numerous complaints about this form of activity, for example that Facebook is using its position in social media to leverage into adjacent markets. There have also been EU antitrust enforcement cases proving these types of issues regarding Google.[1]

11.   Second, by surrounding its core service with a large number of complementary products and services, a platform company can further insulate its most profitable service from competition. If a platform company can convince consumers to operate to a large degree within their ecosystem online, potentially through a combination of pre-installing services on devices, applying default settings,[2] using nudge tactics, and limiting interoperability with rivals,[3] then a new entrant would need to compete on many fronts to displace them.

12.   By launching its video calling 'Portal' products, for example, Facebook can secure demand for its services WhatsApp and Facebook Messenger, the functionality of which are built into the devices. Similarly, with Google's browser Chrome, or its smart speakers with Google Assistant, Google is able to direct consumers towards its search engine through the use of default settings and bundled services. By offering products and services in these adjacent markets – many of which are not profitable or are loss-making – the platforms are able to control the entry points to their core markets, and in doing so protect the primary source of their revenue.

13.   Third, where a platform faces the risk that an adjacent market may impose a competitive constraint on one of its core services in the future, expanding the ecosystem to establish a strong position in that market can insulate the platform from the future threat of competition. This is, for example, one potential motivation for Google's entry into specialised search and display advertising, as discussed in Appendix P and Appendix M respectively.

14.   Finally, by expanding the breadth and variety of the online services provided, Google and Facebook are able to gather increasing amounts of the two critical inputs to the digital advertising market: consumer attention and data. This in turn results in greater advertising revenues, enabling them to invest at

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[1] European Commission anti-trust case, Google Search (Shopping).
[2] The use of default settings in relation to general search is discussed further in Appendix H.
[3] The limitation of interoperability in relation to social media is discussed further in Appendix J.

a greater rate than their rivals, which in turn creates a feedback loop that further cements their dominant position.

15.   The following sections provide descriptions of the ecosystems that Google and Facebook have built around their core consumer-facing platforms for general search and social media respectively. These descriptions, which are non-exhaustive and deliberately simplified for the benefit of clarity, represent the CMA's understanding and interpretation of how these different products and services interrelate and can complement one another. These descriptions do not represent the product descriptions or stated strategies of either company, and should not be interpreted as such.

Google ecosystem

16.   Google offers an extensive range of products and services to its consumers, as well as its advertising and non-advertising business customers. Many of these products and services are interdependent and complement one another.

17.   In this appendix, we have focused on Google's consumer-facing products and Google's activities across the web browsing and search engine value chain.[4] We have sought to illustrate this ecosystem in Figure E.1 below:

Figure E.1: Illustration of Google's online consumer-facing ecosystem
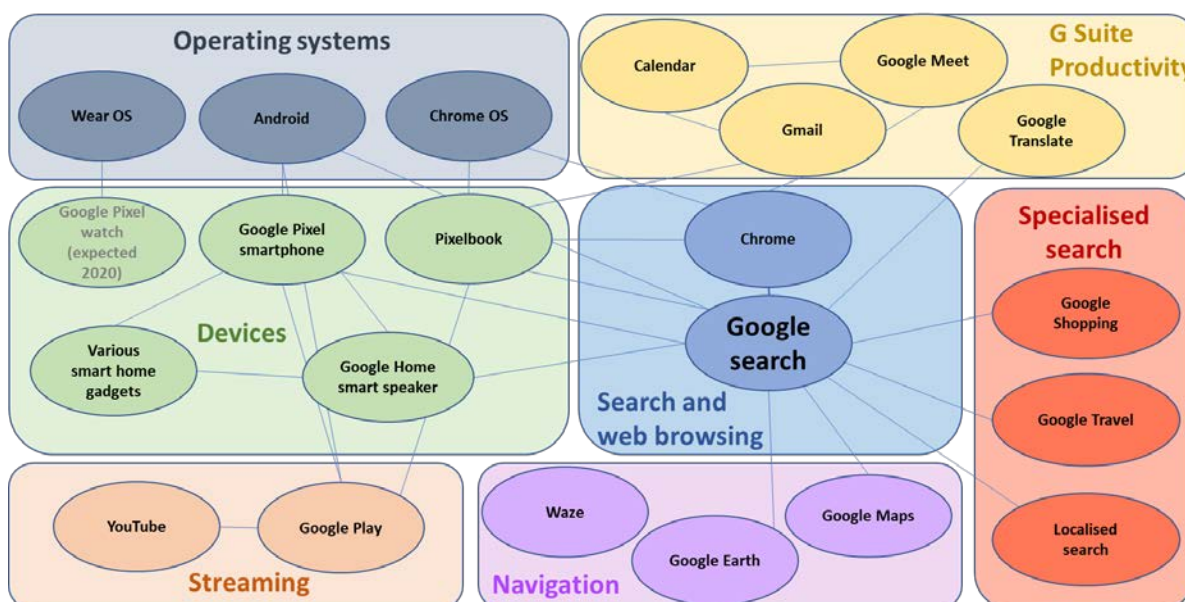
Source: CMA's interpretation of selected Google products and services.

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[4] We have focused here on a range of products and services that support Google's consumer-facing services. We have excluded the services that it provides to companies for digital advertising.

18.   As illustrated above, Google is active across a range of consumer-facing markets, including applications, operating systems and devices. **Web browsers** are the primary access point for search engines and Google owns:

- Chrome, the UK's most-used web browser; and

- Chromium, which is an open-source browser engine and is used by many other browsers, including Microsoft Edge, Opera and Vivaldi.

Table E.1: Browser shares on desktop and mobile devices, UK February 2020

Desktop			Mobile		
Browser	*Browser Engine*	*Share*	*Browser*	*Browser Engine*	*Share*
Chrome	Chromium	60%	Safari	WebKit	49%
Edge	Chromium	10%	Chrome	Chromium	41%
Opera	Chromium	1%	Samsung	Chromium	8%
Safari	WebKit	16%	Firefox	Gecko	1%
Firefox	Gecko	8%	Other	N/A	1%
Internet Explorer	Trident	4%			
Other	N/A	0%			

Source: Statcounter GlobalStats
Notes: Where 'desktop devices' includes laptops and 'mobile devices' includes tablets

19.   Google also owns the following **operating systems**, which help ensure that its web browsers are compatible with the necessary software to function effectively, and can also, depending on how they function, control the flow of user data between applications and systems:

- Chrome operating system, which operates on laptops and tablets; and

- Android mobile operating system, which operates on almost all UK smartphones other than iPhones.

Table E.2: Operating system shares on desktop and mobile devices, UK February 2020

Desktop		Mobile	
OS	Share	OS	Share
Windows	68%	Apple (iOS)	52%
Apple (OS X)	27%	Android	47%
Chrome (OS)	2%	Other	0%
Other	2%		

Source: Statcounter GlobalStats
Notes: Where 'desktop devices' includes laptops and 'mobile devices' includes tablets.

20.   Google also owns a number of different **devices**, such as:

- Pixel mobile phones and tablets, as well as Pixelbook laptops, that use the Android operating system and typically include pre-installed applications such as Chrome; and

- Connected Home Nest Devices, a set of smart home products, which provide an access point for its Google Assistant product.

21. In addition, Google owns many complementary products, described above as the **G Suite Productivity Tools** such as Gmail, Calendar and Drive.

22. Google's search engine also acts a portal for other services, such as **Maps and specialised search services**, such as Travel and Local search. These specialised services, and the competitive dynamics that result from them are described in more detail within Appendix P.

23. Google does not charge its customers to use many of its products and services, such as Gmail, and Google has also made certain programs, such as Android and Chromium available on an open-source basis. As a result, without associated advertising revenues, many of these products and services do not generate substantial profits for Google, or in some cases are loss-making. It is striking to us how many of these products and services can be directly used to draw consumers to Google Search, which drives the majority of Google's revenue through search advertising.

24. The integrated nature of Google's ecosystem also allows it to collect, process and share data between its consumer-facing products and services. As explained in Appendix F, this data includes:

- User information, where the individual has created a Google account, which will include information voluntarily given such as their name and demographic information.

- Information about the apps, browsers and devices used by consumers to interact with Google services.

- Information regarding users' activities on Google services, including their location data.

Facebook ecosystem

25. Facebook also offers an extensive range of products and services to its consumers, advertisers and developers, many of which are interdependent and complement one another. In Appendix J, we have explained the background and evolution of the Facebook Platform, which provides the

foundations for developers to build and grow applications and services that integrate with Facebook and complement Facebook's own products.

26.   The purpose of this section is to illustrate how Facebook has entered into adjacent sectors and markets, often by leveraging its strong position in social media. We have sought to illustrate this in Figure E.2, which is discussed in further detail below.[5]

Figure E.2: Illustration of Facebook's online consumer-facing ecosystem
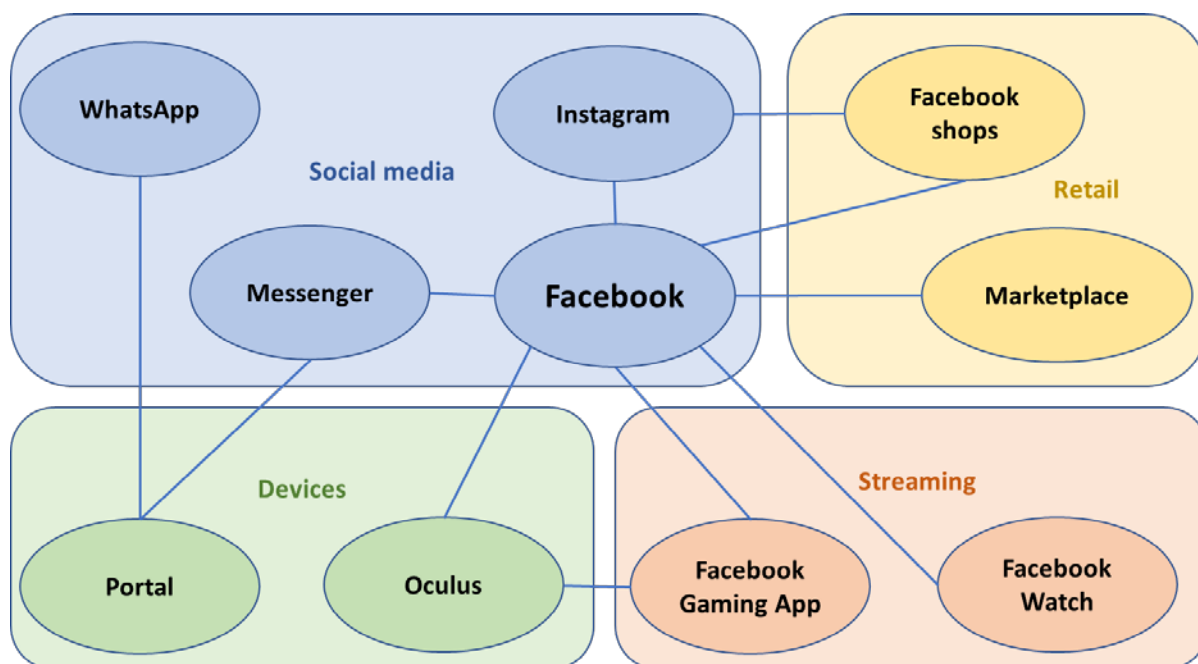
Source: CMA's interpretation of selected Facebook products and services.

27.   Facebook is now active across a range of product markets. Chapter 3 explores Facebook's very significant and long-standing presence within **social media**, through its ownership of the Facebook social media platform and Instagram, and in **messaging services** through Facebook Messenger, Instagram Direct Messenger and WhatsApp.

28.   More recently, Facebook has also begun supplying **devices**, such as Portal products, and has entered into **retail** through its Marketplace. It also recently announced the rollout of Facebook Shops in May 2020, which enables businesses to set up a single online store to sell products on Facebook and Instagram.[6]

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[5] We have deliberately focused here on a range of products and services that support Facebook's consumer-facing services. We have excluded the services that it provides to companies for digital advertising.
[6] BBC (2019), Facebook Shops: Online stores open on Facebook and Instagram

29.   Facebook also offers **streaming services**, such as Gaming and Videos on Watch, in which third parties can integrate their products into Facebook through APIs, as discussed in Appendix J.

30.   The growth of Facebook's presence is these adjacent markets is supported by its New Product Experimentation (NPE) Team which is the in-house developer team that Facebook uses to trial new apps and experiences for users.[7] Recent applications launched by the NPE include Whale, a meme creation tool; Kit, a voice messaging app for the Apple Watch; and Tuned, an app intended for couples to create a private digital space for day-to-day communication.

31.   Each of Facebook's services are integrated across its ecosystem to varying degrees, with the Facebook platform retaining a particularly high level of integration with Facebook's other products. For instance, we observe:

- Full integration for certain services, such as Gaming, Videos on Watch and Marketplace which are available directly through the Facebook platform, whether accessed via the app or a browser.

- High integration for products which are kept in separate applications but interoperate and are easily accessible across one another, such as Facebook and Facebook Messenger. Similarly, the Portal devices are separate products but allow users to make video calls using Messenger or WhatsApp on the devices.

- Limited integration for a small number of Facebook-owned products, such as WhatsApp, which are not currently integrated with other social media platforms owned by Facebook. However, Facebook has publicly stated its intention to increase the data linkage and integrate WhatsApp with its other messaging platforms, Facebook Messenger and Direct Messenger on Instagram, as discussed in Appendix W.

32.   We also note that some of Facebook's most recent announcements, such as the development of its own operating system,[8] are aimed at reducing its dependence on other platforms, which was highlighted as a risk factor in its annual report.[9]

33.   As explained in Appendix F, Facebook also benefits from the amount of data that it collects across its main consumer-facing products: Facebook, Instagram and WhatsApp. This allows Facebook to gather a wide range of

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[7] Facebook, New Products Experimentation
[8] Bloomberg (2019), Facebook Is Building an Operating System for Future Devices
[9] Facebook, Inc. Form 10-K for the fiscal year ended December 31, 2019

information about its users, which may be obtained directly through information supplied, such as gender, education and hobbies, as well as through users' engagement with these services.

Conclusion

34.   In a number of places in our report and supporting appendices, we refer to the importance of the ecosystems that Google and Facebook have been building around their core services. This appendix explains what we mean by this concept, and illustrates the complementarities and interdependencies between Google's and Facebook's expanding range of products and services.

35.   Fully integrated ecosystems, developed by large digital companies with substantial resources and expertise, can deliver significant benefits to consumers in terms of efficiency savings and a more positive user experience.

36.   On the other hand, whether it is the intention of the company or otherwise, such ecosystems can serve to insulate the companies' core services, including those that deliver the vast majority of their revenues, from genuine competition or a credible threat of entry. Ultimately, as a result, consumers could miss out on the kinds of innovative new services that brought Google and Facebook their initial success.

Annex A – Overview of Google's products

Consumer facing products

37.   Devices

- Pixel mobile phone: smartphones running the Android operating system.

- Pixel tablets and Pixelbook laptops: running Chrome OS.

- Connected Home Nest Devices: smart home products including smart speakers, smart displays, streaming devices, thermostats, smoke and carbon monoxide detectors, WiFi routers and security systems, including smart doorbells, cameras and smart locks.

- Chromecast: dongle adaptor for a television, connected via the TV's HDMI port to add smart functions to the TV, such as Netflix streaming. It can also connect to the home network and can be controlled with a smartphone. It also allows the user to connect their laptop or smartphone and mirror the screen.

38.   Operating System

- Android: Used primarily for touch screen mobile devices such as smartphones and tablets. Variants of Android OS have been developed for TV, cars, wrist watches, games consoles, digital cameras, PCs and other electronics.

  (i)   Wear OS by Google: a version of Google's Android OS designed for smart watches and other wearables. Targeted at smart watch users.

- Chrome OS: Chrome operating system, including Chromebooks – a range of laptops / tablet devices designed to be used primarily whilst connected to the internet, with most applications and documents living in the cloud or accessible via the Google Play Store.

39.   Browsers

- Chrome: A cross-platform web browser, also the main component of Chrome OS. Designed to be used by internet users on desktop (Windows, Mac OS and Linux) and mobile/tablet devices (Android and iOS).

- Browser Engine: **Chromium**. Chromium is a free and open source software project from Google. Source code can be compiled into a web

browser. Google uses the code to make its Chrome browser, which has more features than chromium.

- Chrome Web Store: a digital distribution service which serves as an online storefront before installable browser software add-ons that extends the capability of the Chrome browser. Users can browse the Chrome Web Store for Chrome apps, extensions, and themes, uploaded and published by developers. Access to the Chrome Web Store is free for users. Chrome Web Store developers may offer users access to browser extensions, apps and themes (collectively, 'items') free of charge, by purchase, subscription, donation, free trial or in-app payments. the majority of developers offer items free of charge.

40. Search Engine

- Google Search: A web search engine, available in desktop and mobile browsers.

- Google Flights: An online travel research product which i) helps users compare flights/prices across hundreds of airlines and online travel agencies, and helps users complete bookings directly with third-party travel suppliers; and ii) helps travel supplies connect with people researching flights at the moment they express that intent.

- Packages (Holidays): an online travel research product which i) helps travellers compare holiday packages (flight + hotel) and prices across multiple travel providers, and helps users complete bookings directly with third party travel suppliers; and ii) helps travel suppliers connect with people researching holiday packages at the moment they expressed that intent.

- Google Hotel Search: an online hotel search product for users searching specifically for accommodation information. It allows a content rich experience through which i) travellers can find and compare hotels and their prices across a large number of providers, to which travellers are redirected to complete their booking; and ii) helps providers connect with people researching hotels.

- Shopping: a web page where users can search for products and product offers with dedicated search and filtering functionality for that purpose.

- News: a news search engine, presenting a continuous, customizable flow of headlines and links to articles from thousands of publishers and magazines. Available on Android, iOS and the web.

- Scholar: a freely accessible search engine for academic publications and US case law.

41. Complementary Products

- Messages: app and web-based service allowing users to send and receive text messages from that phone or computer. Includes Google Assistant, powered by AI, which provides contextual information based on your conversation. Messages include Chat, which allows users to send and receive messages, either through their carrier service or from a service provided by Google's Jibe subsidiary.

- Entertainment:

    (i)   YouTube: A video-sharing platform acquired by Google in November 2006. YouTube allows users to view, upload, share, add to playlists, report, comment on, and subscribe to other users' video content. YouTube is available on the web, on living room devices and as an app on Android OS and iOS devices. YouTube premium is an ad free, subscription-based service.

    (ii)   YouTube Kids: video app developed by YouTube, providing a version of the YouTube service orientated towards children, with more contained selections of content, parental control features and filtering options. Available on Android, Android TV and iOS platforms.

    (iii) YouTube Music: music streaming service and mobile app developed by YouTube, providing an interface tailored to music streaming. It allows users to browse songs / music videos on YouTube based on genres, playlists and recommendations. Premium services are available to subscribers of Google Play Music and YouTube Premium.

    (iv)   Google Pay: a digital wallet platform and online payment system, powering in-app and tap-to-pay purchases on mobile devices. Users can also send and request money as well as save valuables, such as tickets. For use by Android mobile users and users of other operating systems such as iOS.

    (v)   Google Play (store): a digital distribution service, available to Android users. It allows users to browse and download apps and other digital content on their Android OS device.

    (vi)   Google Play Books: formerly Google eBooks, an ebook and audio-book digital distribution service allowing users to purchase, download,

read ebooks and listen to audio-books. Available on Android, iOS, web and Assistant devices.

(vii) Google Play Games: an online gaming service, and software development kit for Android developers and a place to find game apps for users. Functionality features gamer profiles, cloud saves, social and public leaderboards and real-time multiplayer gaming capabilities.

(viii) Google Play Movies & TV: an online video-on-demand service, offering movies and TV shows for purchase / rental for users wishing to access TV/movies online without a subscription.

(ix) Google Play Music: a music and podcasts streaming service and online music locker. Designed for users wishing to stream music. A 'free' version, and several tiers of subscription services are available.

- Maps

    (i) Maps on Mobile, Maps Web Client on Desktop, Maps Web Client on Mobile: Maps is a free, proprietary web and app mapping service, which offers satellite imagery, aerial photography, and street maps. The service provides route planning and navigation, and real time traffic information, and categorical search capabilities (eg 'restaurants' or 'hotels'). Google Maps also provides additional details depending on location type. For example, a search on Maps for a restaurant allows users to see a brief description, an address, website, the phone number, business hours, a link to the menu, the option to make reservations, photos, and reviews. Users can add and edit locations and their details. Users are not required to register to use Google Maps, though certain features require registration – for example, saving and marking favourite locations, adding labels, and posting location reviews.

    (ii) Google Street View: a feature of Google Maps and Google Earth, providing users with interactive panoramas from positions along many streets around the world. Google uses data extracted from the imagery to improve Google Maps.

    (iii) Waze: A navigation app, designed for iOS and Android mobile devices with GPS support. It provides turn-by-turn navigation information using real time traffic and incident data to improve routing and estimated travel times. Designed for in-car use.

- Android Auto: a mobile app developed by Google to project a driving-optimised interface from compatible apps on an Android device to a compatible car in dash information and entertainment system. Targeted at users of Android devices.

- Assistant: An AI-powered virtual assistant developed by Google that is available on mobile and smart home devices.

- Gmail: A free web-based email service, accessible to users via their browser, a mobile app and using third party programs. Gmail organises email content into a 'conversation view' and has a search orientated interface.

- Google Fit: health-tracking platform developed for the Android, WearOS and iOS platforms. It provides a single set of APIs for apps and device manufacturers to store and access data from fitness apps and sensors on, for example, wearables and connected scales. For mobile users.

- Hangouts: a communication platform which includes messaging, video chat and VoIP features. It replaced Google Talk and Google+ Messenger. Designed for use within the Chrome browser and on Android OS, Chrome OS and iOS.

- Translate: Free translation service, available as an app on iOS and Android mobile devices and on the web.

Products for business

42.   Advertising:

- AdMob: AdMob is a tool for mobile app publishers and acts as both an ad network and a platform. As an ad network, AdMob connects buyers (from Google Ads, Authorized Buyers and DV360) with app publishers looking to monetise their apps with ads. As a platform, AdMob provides mediation services to publishers who want to find buyers for their inventory from multiple ad networks. As a platform, AdMob also allows publishers to integrate their own third-party demand sources through Open Bidding and then bid into the AdMob auction.

- AdSense for Search and AdSense for Content: AdSense for Search provides publishers with text-based search ads related to search queries entered by users in a search box on their websites. AdSense for Content provides publishers with text, display and video ads related to the content of their websites.

- Analytics 360, Analytics for Firebase and Analytics Standard: an app and web analytics services that provide measurement data on how end users are engaging with content and ads.

- Campaign Manager: Google's display ad serving solution for advertisers. It aims to be a user-friendly campaign management tool. It also offers functionality such as reporting, media planning, optimization of frequency capping management and time targeting.

- DV360: Google's DSP. It is one of the DSPs that buys inventory on Authorized Buyers and can also bid on third-party exchanges. As with any other DSP, DV360 provides buyers with display ad campaign management and performance services across ad exchanges.

- Google Ad Manager (formerly DoubleClick for Publishers): Publishers use Ad Manager to forecast the availability of inventory based on historical trends for their website, reserve part of that inventory for specific buyers, and sell the remaining inventory to ad networks or through ad exchanges. Ad Manager was rebranded in June 2018. Before that, its ad serving function was known as DoubleClick for Publishers (DFP) and its ad exchange function was known as DoubleClick Ad Exchange (which is the same as AdX).

- Google Ads: online advertising platform where advertisers set up media campaigns to show digital ads on Google-owned inventory (like Google Search and YouTube) and third-party websites. Where the ads will show depends on advertisers' choices of targeting criteria and ad format.

- Google Marketing Platform: a unified marketing platform that provides free advertising and analytics services to small businesses, and more extensive paid services, targeted at large businesses.

- Google Tag Manager 360 and Google Tag Manager Standard: a tag management system that allows publishers to manage their tags and codes through a single container.

- Local inventory ads: a tool for businesses to showcase products and shop information to nearby users searching within Google.

- SA360: An advertising management platform that helps advertisers efficiently manage search marketing campaigns across multiple search engines and media channels. These include Google Ads, Microsoft Advertising, Yahoo! Japan Sponsored Products, Baidu and Yahoo! Gemini. SA360 is an open platform that can be used to create and

manage text ads, keywords and other targeting items and reports. SA360 can also be used to report conversions from other search engines or media channels such as social media platforms.

- Hotel Ads: a partner-facing platform that lets advertisers create dynamic ads, typically in the form of hotel price and room description, that show within Google's Hotel Search product. Advertising partners bid for travellers searching for hotels on Google Search, Maps or Assistant. Hotel Ads allows partners to configure hotel rate information (availability, rates and room content) and create ad campaigns.

43.　Search:

- Google Cloud Search: a platform providing search services within a company's own systems and documents. Aimed at businesses, and provided as a standalone service, or as part of G Suite.

- Google Manufacturer Centre: a tool that helps manufacturers to provide the most up to date and authoritative product information to improve the accuracy of listings on Google Shopping, Search and other services.

- Search Console: formerly Google Webmaster tools, this is a free, web-based service allowing webmasters to measure their site search traffic and performance fix issues and get information to help improve Google Search rankings.

- Waze Local: Allows businesses to show various types of ads to nearby drivers who are using the Waze app, including map pins, search ads and 'digital billboards'.

44.　Complementary products

- Android Enterprise / Managed Play: the set of management configurations, tools, APIs, apps and websites to allow enterprises (by themselves or via third-party partners) provide Android devices in a workplace environment. Android Enterprise allows companies to better restrict functionality and monitor data on their corporate devices. Managed Play works in conjunction with Android Enterprise by acting as the content marketplace for Android in the enterprise. It allows companies to select, purchase, and manage apps for their organization.

- Chrome enterprise: Offers office license-based services that enables enterprise administrators to manage their organisation's Chrome devices from a single cloud console. Administrators can configure Chrome OS policies for users and devices, such as setting up network access,

controlling extension app installations, managing configurations for specific user groups or the entire organization.

- G Suite: A collection of cloud computing, productivity and collaboration tools, software and products. Primarily designed as a 'business solutions' tool for business users. G Suite for Basic, Business and Enterprise, G Suite for EDU, G Suite for Non-Profits, Cloud Identity and certain legacy free editions.

- Gmail: A web-based email service that allows an organization to run its email system using Google's systems. It provides the capabilities including the ability to access an end user's inbox from a supported web browser.

- Google Cloud Platform: A suite of cloud computing services that include services to manage storage, databases common networking, date, cloud AI, security. For example, customers can use the platform to deploy their own virtual machines, kubernetes clusters and web applications. The platform is designed and intended for business users.

- Google Domains: a domain registration service offered by Google.

- Google Maps Platform: A set of 18+ individual Google Maps APIs that enable including Google Maps service into applications, such as customised mapping and Street View imagery, improved routing including real time traffic info, and precise location intelligence.

- Google Merchant Centre: A tool helping businesses upload their store and product data to Google, and make it available across various Google services (eg Google Shopping, Google product ads and Google Commerce search).

- Google My Business: Provides tools to business owners to help manage their business listings and appear on Maps and Search. Available in both web and mobile platforms.

- Google Web Designer: A desktop-based program for advertisers to create interactive and animated graphical HTML5 and other HTML5 content that can run on any device. It can be integrated with other Google Ads products and is available on Windows, Mac OS, and Linux.

- Hangouts Chat: A direct Messenger service combat allowing teams to collaborate easily and efficiently. Designed for business users as part of G Suite.

- Hire: An applicant tracking system to help businesses manage job listings, display available jobs on third-party job sites, identify and attract candidates, schedule interviews, collaborate with hiring teens and build strong relationships with candidates. Currently only available to G Suite customers.

- Optimize: A website testing and personalisation tool that allows the client to show customers different variations of the same website, and then to use and refine the best-performing options to increase customer engagement with its brand.

- Voice: An admin-managed IP-based telephony service. Among other functions, it allows enterprise customers to assign and manage phone numbers for use by end users in their organization.

Annex B – Overview of Facebook's products

Core Platform

45.   **Facebook Service** – the Facebook website and mobile app. The following user-facing solutions (amongst others) are available to UK users:

a) **Buy and Sell Groups**: This bookmark enables users to find and join Facebook Groups with tailored features to facilitate buying and selling between users.

b) **Device Requests**: Enables users to see and approve login requests from apps on devices with limited input or display capabilities such as smart TVs, digital photo frames and Internet of Things devices.

c) **Events**: Allows users to find events they might be interested in, find events by Pages they like (eg artists and organisations) and receive updates from events they are already connected to.

d) **Facebook login**: Enables users to quickly sign up for or access an online service by providing basic information from their Facebook user profiles. In addition, to the extent users wish to do so, provide the information they have shared with Facebook on their user profiles to other apps and websites, allowing them to seamlessly personalise their online experience on those third-party apps and websites. Facebook Login is one of the Business Tools that Facebook makes available to developers. Developers can also integrate social plugins into their websites and apps in order for users to share content back to their user profiles. For example, where third parties at integrated to the Share Dialog into their websites or apps, users can share content generated on such websites or apps to their Facebook user profiles

e) **Friends**: Enables users to view their friends and friend requests, as well as suggestions of people they may know and can add as friends.

f) **Friend Lists**: Enables users to organise their friends on Facebook by creating and managing their friend lists (eg Acquaintances, Close Friends, etc). Using a Friend List users can post and see updates to/from the specific friends added to the list.

g) **Groups**: A place for group communications and for users to share their common interests and express their opinion. Groups allow users to come together around a common cause, issue or activity to organise, discuss issues, post photos and share related content.

h) **Jobs**: Allows users to find and apply for jobs directly on Facebook. When users want to apply a role, they can create an application and populate this with job history and other information from their Facebook profile, which they can then edit before submission. Users can also subscribe to job alerts.

i) **Live Videos**: Allows users and businesses to connect with their friends and/or followers in a live broadcast and to receive their reactions and comments contemporaneously with the broadcast.

j) **Marketplace**: Allows users to list and browse listings within their geographic area in a structured manner. Marketplace inventory comprises predominantly consumer-to-consumer listings created by Facebook users. Facebook has also partnered with third parties including dealers, portals, business-to-business service providers and aggregators (eg classified ads websites) in the vehicles and real estate sectors who integrate with Marketplace.

k) **Shops**: Launched on 19th May 2020, this service is intended to allow businesses to display and sell products within the Facebook platform. Users will be able to browse products, message businesses to ask questions (via Messenger, WhatsApp or Instagram Direct) and in some cases purchase items directly through an online checkout feature, or otherwise be directed to the sellers' website to complete the purchase. Facebook intends for businesses to be able to set up a single online store which is accessible through Facebook and Instagram.

l) **Messenger**: 'Allows for a rich and expressive way to communicate with people and businesses alike across a variety of platforms and devices, seamlessly and securely'. Facebook has made a stand-alone Messenger platform open to third parties (predominantly businesses) to manage that interaction with Messenger users. The primary API that developers use to access data from the Messenger platform is the Send API, which is key to the Messenger platform's functionality. This allows developers programmatically to send simple text, structured template messages and file attachments, as well as media content (such as images, videos and audio). The Send API includes access to manage a Page's messaging, as well as access to user profile fields for Messenger users messaging the Page.

m) **News Feed**: Each time a person visits News Feed Facebook tries to show that person the context that it thinks will be the most interesting and relevant to him or her.

n) **Pages**: A free and public way for businesses to reach consumers on their desktop computer and mobile devices, and are specifically designed for businesses, brands, celebrities, causes and organisations.

o) **Recent ad activity**: Shows users what ads they have recently interacted with (eg clicked or commented on) or saved while using the Facebook service.

p) **Recommendations**: Shows users their friends' posts regarding suggestions (eg for restaurants or travel recommendations) for a specific area, as well as any posts the user has themselves made requesting recommendations for a specific area.

q) **Stories**: Allows Facebook users or Facebook pages to share visual 'status updates' – either photos or videos – with their friends and or followers. Users can create their own effects go browse and download from the Effect Gallery. Similar functionalities are also available on Instagram, Messenger and WhatsApp.

r) **User profile**: A Facebook user's profile page shows the user's personal details (eg name, profile photo, education history, hometown and current location), as well as any content users posted to the profile (eg photos or location 'Check-ins') or shared from third-party websites or apps using Share Dialogs. A user's friends can interact with posted or shared content on a user's profile such as through the use of the 'Like' button (or other interactions such as 'Love' or 'Wow'), comment on the content or share content to their own profiles or Pages. Users can manage who is able to see content on their profiles through their privacy settings.

46. Additionally, Facebook offers businesses the ability to use certain tools available to users such as a Facebook Page or groups. Within the page overview, Facebook offers various aggregated and anonymous metrics, including information on engagement and actions taken on a business Page. The majority of Facebook's advertisers use **Ads Manager**, a self-service ad platform, to launch and manage their advertising campaigns. This provides advertisers with a simple process for creating an advertising campaign. Through ads manager, advertisers can place ads on the Facebook Service, Instagram, Messenger and on third party mobile websites and mobile applications through **Facebook Audience Network** (FAN).

47. **Instagram** – website and mobile app. The Instagram Graph API, which is based on Facebook's Graph API, is an umbrella term informally used to describe the primary APIs developers use to access the Instagram platform. The Instagram Graph API enables developers to read data from, and write

data into, Instagram with respect to the users of their own services and the relationships of those users to other users and to content. In addition, the Instagram Basic Display API allows users of a developer's app to share the basic profile information, photos and video in their Instagram accounts with the app.

a) **Direct Messaging**: Allows users to send messages to one or more people including photos or videos they take and posts they see in their Feed.

b) **Feed**: The Instagram feed has the same objective as Facebook news feed, ie to present users with content that they most care about.

c) **Shopping**: Enables businesses to offer users shopping directly from organic Instagram posts by making an organic post 'shoppable' by tagging a product, in the same way they would tag a person in a photo. This was first launched to UK users in March 2018. This service is currently available to for free to businesses.

d) **Stories**: Similar to stories on the Facebook Service, Instagram Stories enables users to share visual 'status updates' – either photos or videos – with their friends and/or followers. Instagram users and businesses on Instagram can also share live video on their stories (similar to Live Videos on Facebook). developers can use 'sharing to Stories' to allow users to share content created in their apps to an Instagram Story. Businesses on Instagram can post stories to their accounts.

48. **WhatsApp** – Predominantly a mobile messaging app with voice over Internet Protocol (VOIP) calling. No advertising at present.

Devices

49. **Portal**: consumer hardware smart display device to allow video calling. At present, Portal comprises four devices of varying functionality that provide video calling facility via Facebook Messenger and WhatsApp, augmented by a camera that can automatically zoom and track users' movements. Devices come with Amazon Alexa support as standard however Facebook is working on its own Voice Assistant to run on portal devices. Also incorporates augmented reality effects from the **Spark** platform.

50. **Oculus Virtual Reality Headsets**: A line of VR headsets (Oculus Rift S, Oculus Go, Oculus Quest) that allow users to naturally interact with 3D virtual environments. The devices are primarily aimed at the gaming and entertainment markets.