BRIEFING

European Parliament

European app economy

State of play, challenges and EU policy

SUMMARY

Ten years have passed since the app economy was launched. Since then apps have evolved to play an increasingly important role in the life of citizens and became crucial to the success of many industries. Growing connectivity and availability of portable devices ensure that this trend will continue.

The European app economy is rather successful and accounts for just under a third of revenues in the global market. Clusters of app developers exist in a few western European and Nordic Member States creating well-paid jobs, value and innovation in the digital economy. However, some bottlenecks still exist and hamper the growth of the sector. These include limited availability of finance, shortage of digital skills, the need to constantly upgrade infrastructure, and improving access to data.

The EU strives to address these issues by creating an environment conducive to growth of the app economy. The main policy actions include strengthening the digital single market, funding research and innovation, creating fair taxation rules, developing standards and interoperability, fostering consumer protection and confidence, reforming training and education systems and supporting the development of a data economy and the internet of things.

In this Briefing

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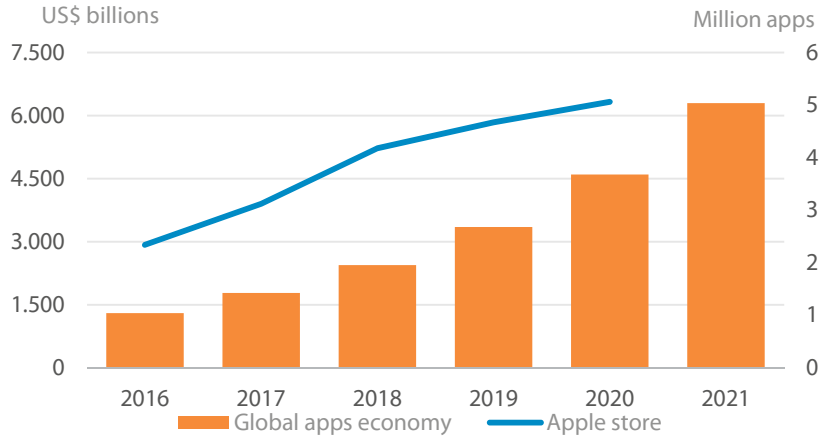
Context

Global app economy

2018 marks a decade since the birth of the app market that started with the launch of the Apple App Store, and Google Play.[1] Since then, and with the increasing availability[2] of smartphones and the internet, the app economy has flourished and is now an important part of daily life in many parts of the world. Apps also play a significant role in many industries, such as travel, retail, gaming, banking and entertainment. In mature markets, users have between 90 and 100 apps installed on their devices (using about a third of them on a monthly basis) and spend an average of two hours a day using them, which corresponds to as much as a month in the year. In the United States alone, the app economy has grown from US$1.9 billion in 2008 to US$143 billion in 2016, and the Americans spend more time on mobile apps than browsing the internet or watching TV. Data shows that users spend most of their time online interacting with the apps. The majority of the most popular apps come from the United States.

The app economy seems to be far from reaching saturation stage. Estimates expect it to grow globally to US$6.3 trillion – almost fivefold from the 2016 value of US$1.3 trillion (see Figure 1). Furthermore, in 2021 the number of global app users is likely to nearly double, to reach 6.3 billion people, who will spend much more time in apps and, mainly due to using apps for e-commerce,[3] will increase spending from US$379 to US$1 008 per person. This will be accompanied by a rapidly growing number of available apps.[4]

Figure 1 – Estimated global app economy and number of Apple apps



Sources: Business Insider, Sensor Tower.

A study from the Joint Research Centre (the European Commission's in-house scientific service) indicated that the increasing availability of the internet, coupled with improving device capabilities, creates a whole new economic model. The traditional 'push' model, in which companies controlled the markets, is replaced by a 'pull' model that has consumers at its centre and is heavily dependent on data. Crucially, apps are increasingly enabling interaction between the providers of goods and services and consumers.

App stores and operating systems

Historically, independent software producers faced high barriers to entry, and focused on adding new features to existing software. App stores changed that, taking care of the distribution, payments and security aspects of business, allowing producers to concentrate on app development. Some small companies and start-ups thrived and the app economy produced a remarkable number of companies reaching high valuations with limited workforce deployed.[5] The relative

decentralisation of the industry is manifested in the fact that 83 % of top app companies are located outside California's Silicon Valley.[6]

On the other hand, it can be said that the two main operating systems for apps (Google Android and Apple iOS) effectively form a duopoly on global markets, having a combined market share of more than 99 %. Initially Apple had a larger market share, but has been overtaken by Android. Android is (mostly) an open source operating system, with available source code which can be used for the creation of other custom operating systems and software modifications, which can, for example, add new functionalities to phones. Apps for Android may come from many sources, not just from Google Play, while apps for Apple, which is a closed system, come from the Apple App Store alone. Android app development is 30 % more costly than iOS, however publishing an app in the Google Play Store is easier and faster. Android is dominating developing nations' markets, such as Asia (apart from China and Japan) and Africa, while the main iOS markets are in developed countries such as Europe, the US, Australia, and Canada.

Table 1 – Comparison of Google Play and Apple App Store

	Google Play	Apple App Store
Number of apps available March 2017	2.8 million	2.2 million
Number of app downloads	82 billion (2016)	40 billion (September 2016-June 2017)
New apps added monthly	150 000	50 000
Revenues	7.8 billion (2016)	28 billion (2016)
Operating system on smartphones (2009-2017)	87.7 % Android	12.1 % iOS
Number of devices	2 billion (2016) Android	1 billion (2016) Apple iOS

Sources: Statista, Androidcentral.com, Digital market Asia, zdnet.com, Talkandroid.com, Business Insider, 2016 and 2017.

Apple's App Store achieves much higher revenue than Google Play, despite having fewer available apps, fewer downloads, and fewer customers. Apple users spend more time on their phones per day, and more time using mobile commerce than those using Android. The majority of Android users live in developing countries where the use of credit cards is lower and are also more price conscious. Finally, on average, an Android app costs less than half the cost of an iOS app. Industry analysis points to the 'winner-takes-all' market, where the most popular apps take the majority of revenues and downloads, while less popular developers earn much less. Some experts argue that the duopoly of Google and Apple is detrimental to competition as it gives these two companies unprecedented control over how and when apps are published and monetised, and even rejects products which they may consider unfavourable to their business. The producers also have to agree to give a standard 30 % of their revenues on apps and in-app purchases to the platforms. Some therefore argue that the barriers to entry and growth have not been lowered in the app economy but shifted elsewhere: even if it is cheap to sell new unknown apps via one of the two stores they are unlikely to be discovered by users without a considerable marketing budget. The chances of being featured on a shortlist of apps suggested to consumers are narrow without substantial financial means.

Controversial aspects

Critics of the app economy argue that it brings about innovation that, while helping to cut costs, leads to more short-term employment prospects and uncertainty for many workers. This view is contested by others who argue that the app economy creates a multitude of new jobs. Another opinion says that intangible intellectual property assets owned by technology companies make it easier to exploit taxation systems. Critics say that the app economy therefore causes redistribution of benefits from taxpayers to the owners of the technology companies. Moreover, they argue that it also causes decreases in certain economic activities, such as in telecommunications, transport and retail.

An International Telecommunications Union paper underlines another important aspect: 'as each app company acquires a new user, its costs per unit fall and its competitive position improves. App companies are in a "**race for scale**" which has led (or has the potential to lead) to a series of monopolies or near monopolies occupying various market niches'. The OECD also points out that these high market-concentration levels are often accompanied by significant consumer lock-in. Changing to another operating system requires purchasing a new device. Furthermore, apps are not easily transferable between platforms. This means users wishing to switch face significant cost barriers.

App economy in the EU

European market

European developers have been innovating and producing more apps as rising smartphone penetration expands the number of potential customers. Several factors are behind this growth. They include growing coverage, increasingly reliable data connections, improved mobile-device functionality, decreasing device prices, growing device sales and available varieties, and the development of new types of connected products such as wearables (e.g. smart watches) and connected home devices.

The European market for mobile devices maintains a strong performance. Mobile broadband access has overtaken fixed broadband access in Europe. In 2016, more than 80 % of persons aged 16 to 74 used the internet, and 79 % of them did so via a smart or mobile phone. Already in 2015, around 90 % of European households owned a smartphone, while 60 % owned a tablet. Accordingly, the number of European smartphone subscriptions is expected to grow steadily[7] from 2017 to 2023, while mobile data traffic will increase more than six-fold in the same period. Since 2012, Android operating systems have become more popular than Apple iOS on mobile phones. On tablets however the situation is the opposite thanks to the popularity of Apple's iPads.

Location, value and jobs

Six EU Member States number among the top 20 countries with most developers:[8] the United Kingdom (456), Germany (307), Spain (239), Italy (137) and Finland (116). The United States leads globally, with 1 567 developers, followed by China with 776. The biggest clusters are located in: London (225), Paris (128), Madrid (86), Berlin and Helsinki (66 each), and Barcelona (58). Helsinki has the second highest concentration globally per capita, after the San Francisco Bay area. EU app markets generally show a low presence of US apps, and correspondingly higher levels of popularity for domestic production, with all of the above countries, except for Italy, owning over 15 % of their national market.

Analysis of the European market shows that 'spatial proximity seems to support cross-border app trade, despite distinct languages; France is especially strong in exports. And all countries showed at least modest amounts of domestic production, led by France and Germany. Finland, which is strong in all regions, also does well on its home continent, capturing significant value from all of the markets studied. Although the bulk of Finland's revenues come from its top performers, especially

Supercell, which are popular around the world, we can see that there are a significant number of other apps by Finnish developers that don't make it outside their local market'. Similar results were reported in a 2016 study that indicated strong performance by local European app publishers in the highest revenue non-gaming apps in their domestic markets.

Another empirical study from 2017 estimated that the UK, Germany and France have the highest number of app economy jobs in the EU, while the Nordic countries are emerging as strong players.[9] It underlined the remarkable growth in app economy jobs, particularly taking into account that rapid growth in the sector occurred during the most severe recession in 80 years. The study puts the number of jobs at just under 1.9 million.

The study also says that, in 2017, Europe[10] overtook the United States in the number of jobs created for the first time. However, taking app economy jobs as a percentage of all jobs (intensity) into account, Europe still scores below the USA. On the other hand, job intensity seems to be growing in Europe while it is declining in the USA. Furthermore, looking at job intensity in the Member States, Finland, the Netherlands, Sweden and Denmark have higher scores than the US, ranging from 1.6 to 2.2 %.

The size of the European app economy is significant. However, there is no single agreed figure or methodology of measurement. Research by the Boston Consulting Group shows that the broader mobile economy generated approximately €75 billion of revenues in the five biggest EU countries in 2013, a figure expected to grow by 25 % annually since then. A frequently quoted 2014 study for the European Commission forecast the revenues for European app companies to amount to €63 billion in 2018, which represents 27 % of the global app market. The study also estimates that the app economy will employ 2.8 million people in 2018 and additionally create 4.8 million support and marketing jobs. Another study estimated that every app developer job in the EU creates an additional 1.31 non-technical and indirect jobs, on average. One example is European companies' success in developing profitable hardware which is complementary to apps, particularly in segments such as the personal internet of things, and health and fitness.

App economy revenues come from two main sources: in 2013, European developers earned €6 billion from app sales; and almost double that (€11.5 billion) from contracting their services, mostly to companies that use apps to support and market their goods and services. This fits the global trend of businesses increasingly outsourcing their app development. Companies generally lack in-house resources to develop apps, while the outsourcing market is mature and has a wide offer. However, they are interested in developing their apps as they help to reduce costs and streamline work processes by having digital and easily accessible data. Enterprise app developers in Europe therefore earn higher amounts per app per month than consumer app developers.

Table 2 – EU and US app economy jobs

	Jobs (in millions)		Intensity	
Year	2016	2017	2016	2017
EU	1.64	1.89	0.7	0.84
US	1.66	1.73	1.2	1.1

Source: Progressive Policy reports, 2016 and 2017.

Barriers to growth

The 2014 study for the Commission surveyed app developers, seeking to identify the obstacles to growth they are facing. The respondents reported that business challenges are more important than technical challenges. These include low priced or free apps, and the domination of US platforms, which all impact on revenues, raise customer acquisition costs, and impede access to capital or financing. The top technical bottleneck has been platform incompatibility. Developers also underlined the need for prompt deployment of modern mobile internet infrastructure, and flagged

up difficulty in supporting multiple languages and inconsistent regulatory policies across EU countries as market difficulties. The skills shortage is also an important issue, as companies cannot find enough domestic skilled employees and they find it hard to compete with US salaries to attract talent.

Consequently, app developers call for easier access to the EU jobs market for skilled staff from third countries. The situation is serious: the Commission predicts a shortage of 825 000 people to fill jobs in the ICT sector by 2020, which is bound to affect app developers. A survey among Nordic app developers found the shortage can be so severe that it results in companies opening offices outside Europe. The report also underlines that insufficient risk capital in the EU makes it hard for companies to scale up.

In 2016, the *Economist* carried out a survey among European government officials and developers in the app economy. The biggest barriers to growth reported by the former are lack of public and private funding and the low priority given to technology within the economy. The latter were asked which government actions are the most helpful for the growth of their business. They reported social support for employees, changes in public infrastructure which improve connectivity and streamlining, and updating regulations. The need for continuous investment in the newest infrastructure was also deemed essential for the apps sector by the Boston Consulting Group.

Enabling access to government data is considered as one quick way to stimulate the app economy, and obstacles to access may hamper the growth of the sector. Another report adds that 'data held by European governments can support the development of innovative apps that increase the value of such data for citizens and potentially reduce the cost of government service provision'. Furthermore, it calls for a genuine digital single market, where apps are not subject to blocking or anti-competitive discrimination, particularly relating to intellectual property rights and telecommunications services. App developers also highlight the importance of an unrestricted flow of data across European borders. They argue that barriers to data flow have negative effects on economies of scale, hamper innovation and competition, and increase consumer costs.

Some EU app developers complain about the dominant position of US platforms, arguing that they abuse their privileged position through the hefty percentage taken from small developers' earnings. Allegedly, the platforms also do not share full access to user data.

European app economy and Brexit

The UK, and particularly London, is a significant centre of the app economy and development in Europe. The *Economist* predicts that in the long-term, app economy activity hotspots may shift, especially from the UK to continental Europe. This could, however, be mitigated by the fact that app company executives do not consider government support a priority when choosing location. Legal uncertainty, shorter supply of digital talent, fragmentation of innovation hubs and increasing frictions between US firms and EU regulators are also mentioned as possible consequences of Brexit, which may lead to slower adaptation to the digital economy both in the UK and the EU.

EU policy

The EU strives to create an environment conducive to growth of the app economy, seeking to balance the light legislative touch required in the sector with the necessity to regulate some of its aspects. There is no one defined policy on the app economy, but many legislative initiatives – concerning, for instance, start-ups, SMEs, finance, taxation and the digital single market – directly affect the sector.

The EU seeks to improve investment in infrastructure necessary for the app economy to thrive with current initiatives such as the Electronic Communications Code, which will create a new telecommunications framework, WiFi4EU to increase citizens' connectivity as well as the 5G for Europe action plan and the 5G-Public Private Partnership project (5GPPP) which will help to implement next generation wireless communication in Europe. EU actions to end roaming charges in Europe should also help in increasing data usage in the digital single market for both consumers and business app users.

A 2016 start-up and scale-up initiative brings together a range of existing and new actions to create a more coherent framework conducive to growth of start-ups in Europe. It will improve access to finance via a Pan-European Venture Capital Fund of Funds and is complemented by other EU funding instruments available to app developers, such as the European Fund for Strategic Investments (EFSI), programme for small and medium-sized enterprises (COSME), and the EU's research and innovation funding programme Horizon 2020. Other elements include insolvency law and the proposal on a common consolidated corporate tax base, which aim to improve the business environment.

Access to finance for the app sector may be easier due to measures such as rules on securitisation, European long-term investment funds and the new prospectus regime. Many barriers to trade in the digital single market will be removed with initiatives such as ending unjustified geo-blocking or contract rules on supply of digital content and sales of goods. This is complemented by actions in taxation, such as simplification of VAT rules for start-ups, micro-businesses and companies selling goods online, and digital taxation. The EU also pursues policy which aims at increasing both the trust and protection of online customers. All these help to strengthen the digital single market which is beneficial for the app economy as it helps to achieve economies of scale, lowers the distribution costs for developers, and creates demand for apps from companies and consumers that are increasingly expanding their online activities. Furthermore, the revised Payment Services Directive is likely to benefit app companies offering finance-related services and provide users with increased security, boosting demand for personal finance apps.

The EU addresses the digital skills shortage with initiatives such as the Digital Skills and Jobs Coalition, which facilitates collaboration between businesses, education providers, and public and private actors, and the New Skills Agenda for Europe which aims at improving education, training and the development of skills. Coding and programming are included in the EU's Key Competences for Lifelong Learning.

The internet of things (IoT) is important for the app economy, as connected devices often come with applications. The EU helps to develop this growing sector of economy by funding innovation, creating a supportive ecosystem and promoting standards and interoperability. The success of IoT depends on development of the data economy, which is supported by a similar mix of measures that combine funding research, innovation and setting standards for big data and cloud computing. A recent initiative on free flow of non-personal data, and the upcoming review of the directive on the re-use of public sector information, will help to further boost the data economy, creating new opportunities for the app sector. The EU also seeks to remove barriers to data flow in its future trade deals.

European app companies are also affected by data protection and privacy rules. The EU seeks to balance the scope of regulation with potential risks for users. Perhaps unsurprisingly, many in the app sector seem rather apprehensive as to the effects of the General Data Protection Regulation, coming into full effect as of 25 May 2018, and express concerns about the proposal for an ePrivacy regulation, arguing that these rules will create disproportionate burdens. However, the app sector welcomed the launch and continuation of the EU-US Privacy Shield, which streamlined the process for transatlantic transfer of EU citizens' personal data. An important upcoming initiative is a proposal for a regulation on fairness and transparency for business users of online platforms.

MAIN REFERENCES

European Commission, Sizing the EU app economy, 2014.

Caribou Digital, Winners and losers in the global app economy, 2016.

M. Mandel, E. Long, The App Economy in Europe: Leading Countries and Cities, Progressive Policy Institute, 2017.

ENDNOTES

1 The Apple App store opened in July 2008, while Google Play opened in October 2008 (as Android Market).

2 There are now around 7.8 billion mobile subscriptions and 5.2 billion mobile broadband subscriptions globally. Data traffic is rising at 55 % a year.

3 This is broadly understood as any monetary transaction through an app, e.g. paying for an Uber ride using the credit card information stored in the app.

4 Although the Sensor Tower estimates in the graph on the number of available apps are higher than those of Statista in the table on p.2 for 2017, they represent a likely general trend of increased offer in an expanding market.

5 This rapid growth is a feature of the digital economy, in which some companies reach high value levels at unprecedented pace.

6 However, the most successful developers are located in the biggest cities of the wealthiest nations such as the USA, UK, South Korea and Japan.

7 Ericsson estimates that western Europe will record annual growth of 3 % in that period, and eastern and central Europe as much as 10 %.

8 Taken from a report by Caribou Digital: Winners & Losers in the Global App Economy.

9 Some of the most successful European apps on a global scale come from the Nordic countries. Examples include such household names as Spotify, Skype and Angry Birds.

10 By 'Europe' the report understands the current 28 Member States plus Switzerland and Norway.

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