

Mobile games in Europe Innovation in European Digital Economy

September 2015



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Executive summary

As the EU looks to grow and unite its digital economy through the newly launched Digital Single Market strategy (DSM), the mobile games industry is the one area of the global tech industry where Europe is a global leader and has been driving digital innovation, not just across the continent, but worldwide.

Every day, millions of people throughout the EU and the world turn on their devices to find enjoyment, challenge themselves, and play against their friends on mobile as well as traditional game platforms.

While the mobile games industry is still young, its impact already extends beyond game development and spills over to companies and workers in other creative industries, benefitting the European digital economy. Furthermore, industry forecasts suggest mobile games will grow at an annual rate of more than 10% until at least 2017.

European mobile app developers capture a large portion of worldwide revenues from mobile games. Several of these companies grew from SMEs to organisations with hundreds of employees in the span of less than a decade. Popular games such as Candy Crush Saga (King), Clash of Clans (Supercell), and many others have been created by European companies and have now become international household names.

More than 90% of the revenues from mobile games come from titles that employ a revenue model known commonly as “freemium”: this approach lets people download and play apps for free and gives them the choice to pay for extra features through optional in-app purchases.

The freemium model is relatively new. While consumers have already embraced it, more work can be done for its commercial and operational aspects to be better understood by policymakers. The Interactive Software Federation of Europe (ISFE), the industry body representing video game companies in the EU, commissioned Deloitte to investigate mobile games and the freemium model. Among other topics, this study investigates the impact of the freemium model on:

- The choice and affordability of games that it provides for **consumers**;
- The competitiveness and growth opportunities it facilitates for **developers**;
- The innovation and entrepreneurship brought to the technology, creative, and related industries, and by extension in the whole **EU economy**.

The study combines desk-based research with the findings from a new consumer survey commissioned by ISFE from Ipsos that polled 4,000 people between the ages of 18 and 64 in Germany, France, Spain, and the UK in May 2015. Six interviews with large and small EU-based mobile game companies informed the developer-focussed topics of the report.

Revenue models for mobile games

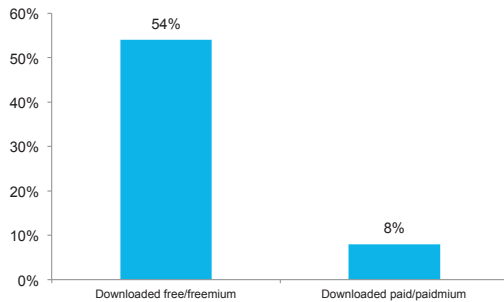
- **Free game:** a game that requires *no upfront payment* for download and that *does not contain* in-app purchases
- **Freemium game:** a game that requires *no upfront payment* for download, is free to play and *does contain* optional in-app purchases. Sometimes also referred to as “Free-to-play / download”
- **Paid game:** a game that *requires an upfront payment* for download and *does not contain* in-app purchases
- **Paidmium game:** a game that *requires an upfront payment* for download and *does contain* optional in-app purchases

The freemium model is benefitting European consumers

They benefit from an extended choice of games, and download more free and freemium mobile games than paid games

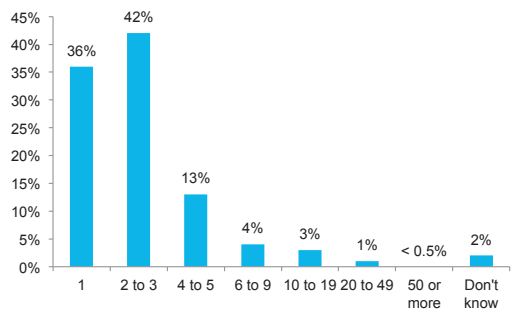
Based on the responses to the survey, it is estimated that 21m people downloaded a free or freemium game in the four markets in the three months leading up to May 2015. In contrast, 3m (or seven times less) people downloaded a paid game. They are also three times more likely to download a free or freemium mobile game in the future than a paid game.

Figure 1: Share of mobile gamers who downloaded a game in the past 3 months, N = 3,728



“21m people downloaded a free or freemium game in the UK, Germany, France, and Spain in three months”

Figure 2: Number of free/freemium games downloaded in the past 3 months, Ipsos/ISFE Freemium survey



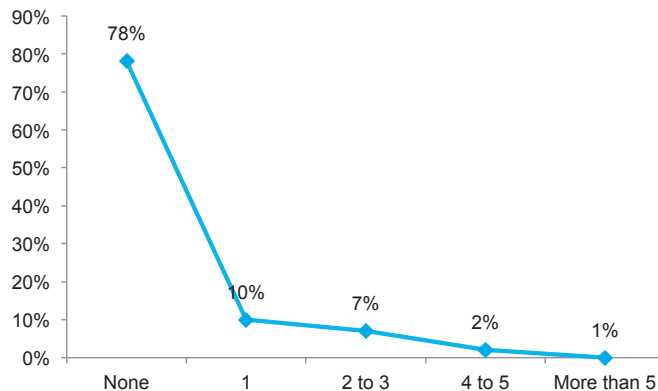
The respondents who played free or freemium games on average acquired three titles during the targeted period. The highest proportion of them, 42%, downloaded two to three mobile games and nearly a fifth of them downloaded more than four. In contrast, a 55% majority of mobile gamers who downloaded a paid or paidmium game acquired only one.

The attention of consumers is not concentrated among a few titles but rather dispersed throughout a broader base of games. The survey results suggest that only half of mobile gamers had played any of the nine freemium games included in the survey that in May 2015 occupied the lists of top grossing and most popular games. The remaining half thus played games from the rest of the app stores' offerings.

Consumers would download and play fewer games if they had to pay upfront. The survey responses suggest a 72% decrease in downloads if games were priced at €1.99 and a 86% decrease if offered at €4.99, even when people considered the games they already play. The finding also implies that overall revenues in the industry would decrease, as the estimated download revenues would not offset the reduced revenues from in-app purchases.

The majority of mobile game players do not make in-app purchases in their games

Figure 3: Number of freemium games in which in-app purchases were made over the past 3 months, Ipsos/ISFE Freemium survey



“During the three months prior to the survey, 78% of players of freemium games did not make any in-app purchases in any of the games they played”

During the three months prior to the survey, 78% of players of freemium games did not make any in-app purchases in any of the games they played. This translates to 22% of players making an in-app purchase in at least one game. The share of paying customers can be much smaller for individual companies. For example, approximately 4% of King's monthly unique users made in-app purchases in its games as of December 2013.

According to the survey results, the estimated average expenditures of paying users during that period reached €£3 per month.

“70% of those who played any of the nine freemium games listed in the survey said that these apps contained the option for in-app purchases”

Consumers are aware of in-app purchases at the time of download as well as during gameplay

Consumers are aware of the availability of in-app purchase options both at the time of download and during the progress of the game. In a list of 15 popular app games across the freemium and paid segments of the market, 70% of those who played any of the nine freemium games listed in the survey said that these apps contained the option for in-app purchases, while only 10% said they did not contain in-app purchases. In addition to developer information like contextual notices/pop ups about payments, the wider ecosystem also plays a part in informing consumers, eg, through payment authorisation settings and options for families and individuals.

European game developers represent a European digital success story

Game developers embraced the freemium model early in its lifecycle

Unlike games that use traditional revenue models and generate revenues at the point of sale, freemium games generate no direct revenue for developers at the time of acquisition because of their free price point. Players can become paying customers if they are satisfied with the game and want to enhance their experience. This motivates developers to create strong relationships with their customers and provide quality updates. As a result, the model allows developers to generate revenues throughout the lifetime of the game by providing new functionality, creative features and improvements for their customers.

The model of free to download games allows developers of all sizes to reach new customers

The freemium model allows people to try new games without committing any money upfront. The zero costs of download also help with international expansion. The digital nature of the marketplace and the reach of app stores allow European developers to take advantage of global audiences, who generate more than 35% of their total revenues.

“Fewer than 5% of consumer support queries relate to billing and payments”

As the industry grows, an increasing number of games compete for players' attention. Marketing costs can grow quickly in this environment, however developer interviews suggest that companies of any size can successfully compete as long as they can provide quality games. Creativity and social networks can help even small developers reach large audiences.

The developing industry favours transparency and self-regulation

As the mobile games industry has grown and evolved over the past decade, some game titles have attracted scrutiny over their use of the freemium. Mobile game developers favour transparency and many have adopted self-regulating measures to mitigate any possible concerns. For example, some developers include additional screens and pop up notices that educate players about in-app purchases, while others proactively contact players who spend higher amounts to ensure their purchases are intentional.

Transparency and self-regulation contribute towards a low share of queries related to billing and payments among developers' customer support queries. Two major developers interviewed for this study reported that fewer than 5% of their consumer support queries relate to billing and payments. A majority of them concern missing payment confirmations or delays in delivery of in-game objects due to slow internet connection and are not related to unintentional purchases.

European developers have emerged as world leaders in the mobile games industry

Many of the games that survey respondents downloaded came from European developers, who have emerged as world leaders in the mobile game industry. Companies such as King (UK/Sweden/Spain) and Supercell (Finland) have reached billion euro valuations on public and private markets, and hundreds of other enterprises and SMEs have been formed over recent years to provide entertainment to mobile gamers around the world.

Innovations and skills created by the mobile games industry can fuel Europe's digital economy

On 6 May 2015, the European Commission (EC) released its strategy for a Digital Single Market (DSM). The DSM Strategy includes pillars such as creating the right conditions for digital networks and services to flourish, and maximising the growth potential of our European Digital Economy.

Against this background, the European mobile games industry represents a success story for digital development: it has delivered and is expected to continue to deliver positive business and employment impacts to Europe.

The increasing popularity of mobile games impacts the wider digital economy

Low barriers to entry in the industry allow new companies to participate in the growing market. As a result, economies can add jobs and generate tax revenues. The special needs of games companies and other innovative digital players can even create new types of jobs, such as data scientists, that improve the competitiveness of countries and the EU as a whole in the digital economy. This study estimates that in 2014 the freemium model supported 21,000 full-time employees throughout the EU-28.

The industry economic effects are magnified in regional hubs

Hubs and clusters form when developers co-locate in areas occupied by other technical companies and wider creative industries. London, Berlin, Helsinki, and Stockholm have spawned vibrant hubs that attract talent and capital, and boost the broader digital economy.

The hubs are not limited to only mobile game developers, as other game companies and creative industries can be a source of talent and creativity. In the UK, for example, mobile games companies are often co-located near other creative industries such as software, advertising or design.

The connecting feature of hubs has significant economic benefits. For example, the concentration of telecoms, media, and technology industries in London was estimated to contribute over £125bn to the UK's GDP. Its tech sector also generated 27% of the city's job growth between 2009 and 2012. This experience is similar throughout Europe, where hubs of creative and digital industries have led growth of employment and the economy.

1 Introduction

The Interactive Software Federation of Europe (ISFE), the industry body representing video game companies, commissioned Deloitte to develop a study that investigates mobile games and the freemium model from the point of view of consumers, developers, and the broader economy. The study combines desk-based research with the findings from a new consumer survey commissioned by ISFE with Ipsos and conducted in Germany, France, Spain, and the UK in May 2015 (“survey”), as well as on a series of six interviews with large and small game developers across the EU.¹

Millions of consumers have bought mobile devices to communicate, grow their productivity, or find entertainment through apps. The adoption of smart mobile devices has grown together with a booming app economy, of which games have become an integral part. Games are among the most downloaded apps on the market and they generate substantial revenues.

New business models in the mobile industry have appeared alongside the new devices. The freemium model, which lets people acquire apps for free and allows them to choose to pay for extra features, quickly came to dominate many segments of the industry, particularly games. The model also successfully features in games on consoles and PCs as traditional developers embraced it as a way to provide extra features to their consumers.

Europeans are active players of games on mobiles. Often they play games made by European developers, who have emerged as world leaders in the industry. While other reports have looked at the continent’s app economy at large, this study is the first one to focus on its mobile game segment.

The value of free products and services is difficult to measure using traditional economic metrics. For example, Gross Domestic Product (GDP) does not consider products provided for free. Some studies have tried to estimate the value using other concepts such as consumer surplus, which estimates the value that consumers derive from goods above what they pay for them, but these measurements can be skewed by a choice of assumptions. **As a result, this study only estimates the full-time employment in the mobile gaming sector in the EU-28.**

The report is structured as follows: section 2 describes the broader app ecosystem; section 3 focuses on the freemium game model; section 4 provides the views of the model from the developers’ perspective; and section 5 presents the results of the consumer survey.

Revenue models for mobile games

- **Free game:** a game that requires no *upfront payment* for download and that *does not contain* in-app purchases
- **Freemium game:** a game that requires no *upfront payment* for download, is free to play and *does contain* optional in-app purchases. Sometimes also referred to as “Free-to-play / download”
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2 The app ecosystem

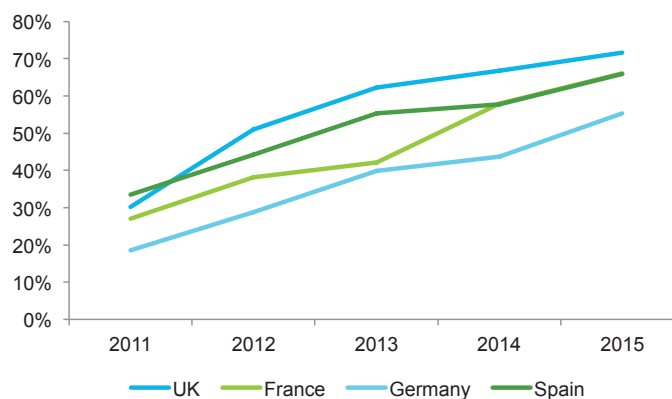
Over the past eight years, apps for mobile devices have become a critical element of the digital ecosystem. Apps first appeared for smartphones and have since expanded their reach with the introduction of tablets and wearables on platforms created by Apple, Google, Microsoft and other companies.

European companies have developed many apps that have gained worldwide popularity, created thousands of jobs, and generated billions of dollars of revenues. Music apps such as Spotify, founded in Stockholm, or the London-based keyboard replacement app SwiftKey are installed on millions of mobile devices around the world.² The success of European apps is even more pronounced in the game industry, where companies such as King (UK/Sweden/Spain), Supercell (Finland), Wooga (Germany) and Gameloft (France) are world leaders.

2.1 Apps and smartphones develop together

Developers have been innovating and producing more apps as the growing smartphone penetration increases the number of potential customers. Smartphone penetration stood at 62% in the UK in 2013, which corresponds to nearly 40m smartphone owners in the country. Less penetrated markets, such as Poland and Romania, are quickly catching up; penetration more than doubled in both countries between 2012 and 2013, to 28% and 35% respectively.³ There are currently more than 2bn smartphones and 1bn tablets around the world.⁴

Figure 4: Smartphone penetration in the countries covered by the survey⁵



App stores play a crucial role in the distribution and marketing of apps. Through their standardised approach to acceptance of new software, app stores help to lower the barriers to entry for developers. By providing the central space and infrastructure to host, market, and monetise the apps, the app stores decrease the time developers need to spend on distribution. App stores also handle the entire payment processing for sales of games as well as in-app purchases; developers then receive a share of the revenues. The digital nature of the marketplaces allows developers to instantly reach international audiences.

2.2 Game apps generate the most revenues

Apps extend the functionality of mobile devices and are integral for their users. In 2014, Apple announced that its customers had downloaded more than 75bn apps from the iOS app store since its inception.⁶ However, the most downloaded apps do not always generate the highest revenues. While social networking apps used to log into Facebook, Instagram, or Snapchat, are among the most downloaded apps in stores, game apps generate the highest revenues via payments for downloads and purchases

within the apps.⁷ Monetisation of mobile games typically relies on having a large user base in which a small share of players pays for optional in-app purchases. Research by Morgan Stanley, an investment bank, suggests that 70% of app store revenue for Apple and Google originates from games.⁸

The social aspect of games is important for their popularity. Many games integrate with social networks such as Facebook to connect players with their friends. Facebook has played an important role in the development of the current gaming industry. Its in-browser Canvas platform was the first one to allow tens of millions of gamers to play against one another. The concept later successfully transitioned to mobile devices, consoles, and PCs, and spawned a number of internationally successful companies.

App developers employ various business models to generate income. Revenue streams from payments at the time of sale, in-app purchases during play, or in-app advertising are the most popular among mobile game developers. The revenue models are not mutually exclusive and can be used in conjunction with each other. For instance, a game's main business model may be freemium but it could also be subsidised by advertisements.

The ability to monetise game content throughout the lifetime of a game through the freemium model has driven developers to reduce the prices of their apps towards zero and continuously create extra content and functionality. The freemium model now dominates the ecosystem of mobile games and provides an estimated 95% of its revenues.⁹

2.3 European developers are successful

The European Union boasts a successful community of game app developers and mobile publishers in general. Several studies have investigated the overall size of the European app economy but their estimates differ, as there is no single standardised way to measure it. For example, some studies count non-earning hobbyists as part of the economy, or include contract work unrelated to app store sales. The examples below show estimates of the overall app economy that mobile games are a part of:

- A study for the European Commission estimated that the revenues of the European app economy exceeded \$23bn (€17bn) in 2013.¹⁰
- According to Boston Consulting Group, the broader mobile economy generated approximately \$100bn (€75bn) of revenues in EU5 in 2013 and the figure is projected to increase by 25% per year until 2017.¹¹

The size of the European app economy is significant regardless of the method used to estimate it. Mobile games companies form an important part of the European app economy and affirm its strong position worldwide. In addition to King and Supercell, other successful mobile game companies from the EU include Wooga (Germany), Gameloft (France), Digit (Ireland), and Rovio (Finland). Many of their products have become household names such as Candy Crush Saga and Angry Birds, and spawned branded franchises beyond video games. Some of the traditional game companies, such as Electronic Arts and Disney, have also successfully embraced freemium in the mobile versions of their games as well as on consoles and PCs, and their teams throughout Europe provide sizeable contributions to its app economy.

The digital nature of the products and the reach of the app stores have allowed European companies to serve players beyond their local markets. Consumers in the United States, China and Japan, the three markets that generate the highest app revenues,¹² buy the digital exports from European app developers. **In 2014, European mobile game developers generated over 35% of their revenues outside of the EU-28.**¹³

Several European game companies have achieved multi-billion dollar valuations. King, the maker of puzzle game Candy Crush Saga and based throughout Europe, completed its initial public offering in 2014 and its market capitalisation currently exceeds \$4bn (€3.6bn).¹⁴ Other companies have remained private but their likely value exceeds one billion dollars. For example, the Finnish company Supercell, the maker of strategy game, Clash of Clans, had an implied valuation of more than \$3bn (€2.7bn) when a Japanese telecommunications group, SoftBank, purchased a 51% stake in the company in 2013.¹⁵ Softbank went on to buy a further 22% stake two years later for an undisclosed sum.¹⁶

3 Mobile games: the freemium model

Freemium, a portmanteau of ‘free’ and ‘premium’, represents “a method of selling in which the basic product is free, but customers pay for extra features.”¹⁷ The model found popularity in the market for apps, where it allows consumers to easily try new products for free and generates revenue only from users who choose to pay for extra features.

The freemium model has become prevalent in games on mobile devices and has expanded to games for consoles and PCs, as traditional game developers seek to offer additional functionality to their players as well.

Freemium games are free to download and play. Players can make payments in the game if they choose to extend their experience with additional objects, levels or functionality through in-app purchases. The freemium model suits the characteristics of games. As a result, nearly all top-grossing games have adopted it.¹⁸

3.1 The freemium concept

The freemium model has changed the prevailing revenue strategy for commercial game publishers. In the past, traditional developers generated revenues at a point of sale of the game or its discrete expansion sets. The freemium model allows developers to introduce improvements and new content more frequently and fluidly via downloads from the app stores. These new technologies make it easier for developers to engage with the consumer on an on-going basis as they develop a relationship through the game.

Developers generally get no direct revenue when the users acquire the game, but by engaging them over a longer period and by demonstrating the game’s value, they can generate revenues throughout the lifetime of the game. In addition, developers can include other revenue streams such as in-app advertising to diversify their revenue model, although many of the top-selling games do not include these revenue streams.

Mobile games benefit from network effects similar to social networks or search engines. The ability to connect and play with a large number of other players makes games more appealing. However, mobile games do not result in the “winner-takes-all” scenarios seen in other markets. Broad networks of players help games become more popular but do not disadvantage competing games. To the contrary, the free nature of games lets people play multiple games simultaneously. According to the ISFE/Ipsos survey, mobile gamers downloaded on average three games in the first quarter of 2015, with more than 64% downloading more than one game.¹⁹

3.2 Features of in-app purchases

Freemium games offer the core game for free but let players make optional in-app purchases during gameplay. While each game is different, the in-app purchases fall into two broad categories:

- **“Consumable” in-app purchases** can be used only once. For example, additional lives or coins for faster upgrades can be redeemed in the game and a player needs to buy them again if they wish to repeat the action.
- **“Non-consumable” in-app purchases** do not expire with use. They remain registered with the player’s account and can be accessed repeatedly. For example, players can buy new levels for some games and visit them perpetually in the future.

After the zero cost of obtaining the game, the price of individual in-app purchases is typically low, often around €0.99 per purchase. For example, buying “gold bars” for extra lives or moves in Candy Crush Saga costs £0.79.²⁰ Options that bundle more functionality or more advanced features are also available

for higher prices. For example, a “pile of gems” in Clash of Clans contains 500 units of in-game currency that players can use to buy resources or speed up the construction of buildings.

The gems in Clash of Clans or gold bars in Candy Crush Saga are examples of in-game currencies that developers incorporated into their games to create their own “micro economy”. Players can spend the currency on traditional in-app purchases such as upgrades or energy replenishment without making a purchase with their credit card every time. As the price of a typical upgrade is low, individual purchases would be intrusive for the player and uneconomical for the developer.

While in-game currency and general in-app purchases can be bought to enhance or speed up the game, they are generally not necessary to play the game. Central to the game model is consumer choice. Players can earn currency by playing the game, or choose to gain additional lives by waiting. The developers interviewed for this study emphasised that the equal quality of experiences for paying and non-paying players is critical for them. Many use social networks to connect with their customers to solicit feedback about level design or its difficulty. **As non-paying players represent up to 98% of their consumers, unequal treatment could result in negative feedback and abandonment of the game.**^{21,22}

In-app purchases in video games on other platforms

In-app purchases and the “freemium” model are not limited to mobile games only. For example, players of FIFA Ultimate Team, a football game mode made by Electronic Arts that is also available on PCs and consoles, can build teams from real world players and staff and compete against others in online and offline matches. Through playing the matches, players earn in-game coins that they can use to improve their teams; alternatively they can do so through in-app purchases.

PC and console games also incorporate in-app purchases in other ways, for example through downloadable content (DLC) that is frequently not consumable and instead remains in the player’s account after purchase. For example, users can repeatedly play purchased maps in Battlefield 4, a popular first-person shooter, or drive new cars in Forza Motorsport, a racing simulator. In contrast, the consumable in-app purchases that are available in mobile games, for example the reduction in waiting time between plays or increased construction speed, are typically not available for PC and console games.

Subscriptions for multiplayer games on PC and consoles represent a special type of recurring purchases. For example, players of massively multiplayer online role-play games (MMORPGs) such as World of Warcraft pay a monthly fee of €12.99²³ per month to access the online servers even after they purchase the disk with the game for €14.99. Even this model is changing. New games such as League of Legends or Dota 2, also popular MMORPGs, are free to download and play, although players can purchase DLC.

3.3 Suitability of freemium for mobile games

Price is the key in the player’s decision to download a game. The industry has moved towards free downloads to build large audiences. Requiring an upfront payment would reduce the game’s attractiveness and therefore reduce the viability of the long-run revenue generation.

An academic study by researchers at New York University and City University of Hong Kong investigated the impacts that the offering of in-app purchases has on demand for apps. They found that the additional objects and functionality provide a stimulus and can generate 17% additional revenues for developers after the player acquires the game over what a paid game can generate. In contrast, upfront payments and in-app advertising can negatively affect the demand, which inhibits the growth of audiences.²⁴

As the games are free to download, developers can adopt two approaches to monetising the freemium app. They can target a large number of people and convert a small percentage of them to paying customers, or focus on a smaller group of consumers but seek to convert a greater proportion to paying consumers.

Mobile game companies have predominantly adopted the first strategy, as user acquisition is relatively easy due to **a large number of potential users, app store-based distribution, and network effects**. However, conversion to paying consumers remains more challenging. For example, King had more than 364m monthly unique users playing its games but only 8.5m unique monthly payers in the first quarter of 2015. Approximately 4% of King’s unique users pay to play their games as of December 2013.²⁵ In the first quarter of 2015, the average sum spent by a unique paying gamer was less than \$24 (€22) per month.²⁶ Among the respondents to the survey conducted for this study, an average paying gamer spent approximately €1/£3 per month across all games played.²⁷

Player acquisition and retention are important metrics for the developers as their fulfilment results in a group of satisfied consumers who are more likely to convert into payers. A study by Amazon shows that players who remain active for more than seven days after the initial download of the game generate 74% of developers' revenues, and those that play for thirty days spend 60% more money on in-app purchases than short-term users.²⁸ The large number of available games and the associated competition for attention means that only a fraction of players will remain active for seven days. The fraction of players who remain active for thirty days is even lower. As a result, it is important for developers to build as large an audience as possible to operate in this funnel. The ability of the freemium model to facilitate such scale is one of the key reasons why it has become a de facto standard in the mobile game industry.²⁹

3.4 Questions around the freemium model

As a young and developing business concept, the freemium model has attracted scrutiny about its use of in-app purchases and the awareness of the model among consumers.

Both the responses to the survey in this study and interviews with developers suggest consumers are aware of the model and how in-app purchases work. **The developers interviewed for this study noted fewer than 5% of any consumer support queries relate to billing and payments. A majority of them largely concern missing payment confirmations or delays in delivery of in-game objects due to slow internet connection and are not related to unintentional purchases.**³⁰

Interviews with developers indicated that the industry acts to mitigate any issues proactively by promoting transparency as it matures. For example, some developers show special screens upon the first start of the game that inform players about the existence of in-app purchases, while others proactively contact players who spend higher amounts to verify their purchases are intentional. Consumer support teams and engagement through social media directly with developers also give players the ability to voice any concerns.³¹

The developers interviewed for this study welcomed the 2014 initiative facilitated by the European Commission, which required app stores (Apple and Google) to strengthen payment authorisation settings and discontinue using the text "Free" when offering games with in-app purchases, in order to indicate that the games have an optional paying element.

4 Freemium’s impacts on the European economy

The freemium business model has enabled a major wave of innovation in the video game industry, especially in Europe. Its emergence has spawned global companies and delivered entertainment to millions of people around the world.

European developers of games have established themselves as leaders in the global app economy. Of the top 10 apps in the iOS app store and Google Play store, six were made by companies headquartered in Europe.³² Mobile games are popular among Europeans. According to the survey commissioned for this study, there were more than 21m players of mobile games in France, Germany, Spain, and the UK alone. Together it is estimated that the freemium model supports 21,000 full-time jobs throughout the EU-28.³³

Figure 5: Sizes of mobile game economies and employment in mobile game companies

Country	Full-time employment
France	3,000
Germany	4,000
Spain	1,000
United Kingdom	5,000
Total EU-28	21,000

The mobile game industry generates economic impacts through more channels than just the revenues generated in apps. By serving as a catalyst for entrepreneurship and enabling the creation of technological hubs in cities, the industry creates further economic benefits.

Catalysts for entrepreneurship

Europe has seen a strong growth in the number of video game developers. In the UK, for example, more than 90% of game companies were formed after 2000. The shift to mobile is apparent: in the period between 2011 and 2013, more than 75% of newly established game companies developed primarily for mobile.³⁴

The existing game companies are often catalysts of new business creation. Developers who gained experience working for an established company or a start-up can create their own company and game at low cost. The digital nature of the business, including the cloud-based infrastructure, allows entrepreneurs to operate with small teams yet deliver their games to players around the world. For example, King and Supercell, the market leaders, employ 1,500 and 150 people in different offices and countries respectively as of July 2015.³⁴ In Wooga, 270 people develop its games and run the company. These developers have grown from small SMEs into multi-million euro companies quickly within a few years.

Games companies employ not only developers, designers, and other workers traditionally associated with game development, but can also create new types of jobs. Mobile games can produce data that companies analyse to improve player retention, engagement, and monetisation. Analysing the data and drawing conclusions from them has resulted in high demand for data scientists, whose advanced programming and statistical skills are necessary to tackle the new “big data” problems. Roles in marketing, recruitment and business development are also in high demand.

The relatively small sizes of the market leaders can also be seen in the rest of the industry, particularly in start-ups. A study by Nesta, the UK charity focused on innovation, estimates that London-based companies that specialise in development of games for iOS have on average five workers. The relatively small staff requirements for new companies reduce the barriers to entry into the industry and enable entrepreneurship.³⁶

The advances in cloud computing have allowed companies to outsource parts of their technology infrastructure to external providers. Companies such as Amazon provide managed technologies that can handle tasks from analytics and monitoring to database storage and processing power.

Previously, companies used to acquire and manage many of these services in-house, which required labour and capital expenditures. The shift to the cloud has changed the nature of infrastructure from fixed to available on demand. In turn, developers can use exactly the amount of computing power they require. Supercell, for example, uses the cloud for data storage, processing large datasets, and communication channels to manage the external servers and infrastructure.³⁷

4.1.1 Small game developers

While the top-grossing charts are dominated by multi-million euro companies, small studios also contribute to the mobile game industry and benefit the economy. The combination of external infrastructure and app store distribution lowers development costs and helps small entrepreneurs succeed. Together these factors reduce the need to have a large publisher that would provide funding for development and marketing.³⁸

Both Apple and Google actively highlight quality apps regardless of their underlying budgets to let them raise their profile among the large number of apps available in the app stores. By promoting apps on the front page of the store, small developers get exposure that can potentially translate to hundreds of thousands of downloads.³⁹

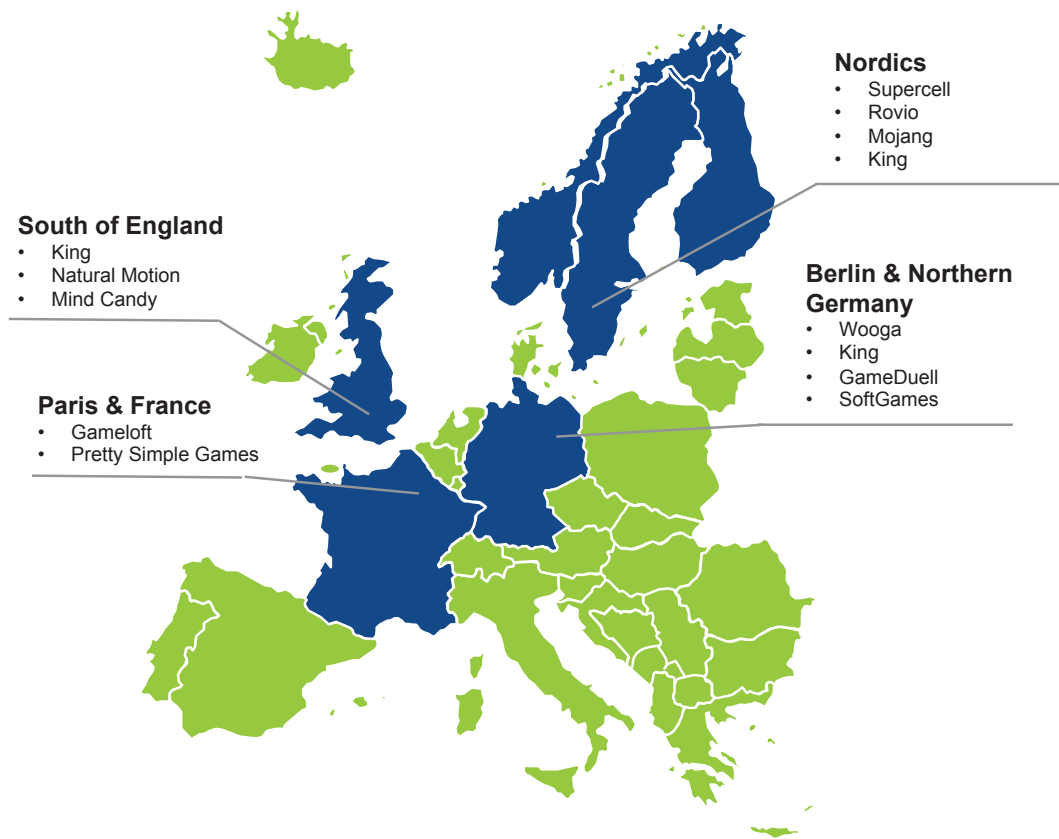
The indie developers interviewed for this study indicated that they are not competing directly with the large established players. The different economic circumstances allow indie developers to create simpler, but nonetheless high-quality, games, with different lifespan and lower reliance on long-term monetisation strategies.⁴⁰ They stated that the services offered in the ecosystem allow them to focus on producing quality products and creative marketing campaigns without spending energy on unnecessary distractions. While they cannot compete with the large firms' marketing budgets or game complexity, their lower break-even points make them profitable even without audiences of tens of millions of players. In fact, **the freemium model levels the playing field for small developers who do not have an established brand**. By making the games free to download, the freemium model allows consumers to try games regardless of their brand recognition and evaluate each on its qualities.

4.2 Emergence of developer hubs

The growth of the mobile game industry amid the success of the freemium model has led to the creation of clusters of developers throughout the EU. Clusters emerge when founders decide to start companies in areas with ready access to talent and funding. Conversely, candidates and venture capitalists tend to move to areas that provide opportunities for employment or investment.

The multiple well-known universities and a concentration of global capital in London make it an attractive location to start a company. Helsinki may seem a less obvious choice at first, but the city has become a major developer hub thanks to its abundant engineering talent nurtured by Nokia and the high-quality technical university, Helsinki Institute of Technology. EA, Supercell, and Rovio alone employ more than 600 people there.⁴¹ In neighbouring Sweden, Stockholm represents another Nordic centre for game development thanks to the proximity to the mobile company Ericsson. Both Mojang, the maker of Minecraft, and King have offices in Stockholm.⁴²

Figure 6: Selected developer clusters⁴²



In addition to outside cloud computing solutions, mobile game companies often rely on a network of external employees from creative industries. Wooga, for example, engaged more than 50 external artists when creating its mobile game Agent Alice to accommodate their staffing needs during different points of the game development cycle.⁴⁴ As external employees work closely with permanent staff, companies seek freelancers located nearby to simplify their communication and cooperation. Developers interviewed for this study indicated that their use of short-term contractors is motivated by the need to obtain specialised skills during specific times of the game development lifecycle and not cost reductions. This is evidenced by their focus on local talent and not outsourcing the jobs to countries with lower employee costs.⁴⁵

The hubs are not limited to only mobile game developers, as other game companies and creative industries can be a source of talent and creativity. In the UK, for example, mobile games companies are often co-located near other creative industries such as software, advertising or design.⁴⁶

The connecting feature of hubs has significant economic benefits. For example, the concentration of telecoms, media, and technology industries in London was estimated to contribute over £125bn to the UK's GDP.⁴⁷ Its tech sector also generated 27% of the city's job growth between 2009 and 2012.⁴⁸ This experience is similar throughout Europe, where hubs of creative and digital industries have led growth of employment and the economy.⁴⁹

5 Consumer attitudes towards mobile games

The survey asked 4,000 consumers in France, Germany, Spain, and the UK about their habits regarding mobile games. ISFE has been monitoring consumer habits and attitudes towards video games since 2011 through its GameTrack survey (people aged 11-64), conducted by the international survey company Ipsos, and questions relating to this study were added to the main tracking survey in May 2015.⁵⁰ Additionally, results from the freemium survey shown in this study are based on respondents aged 18-64. The appendix discusses the methodology in more detail.

The survey responses indicate that many people play games on their mobile devices. The freemium model allows them to try more games than paid models. Only a few players pay for items through in-app purchases and on average spend relatively little on a monthly basis. Consumers are aware of the features of the freemium model and are likely to download more games in the future. They are more likely to download new freemium games in the future rather than paid games.

3.1 Attitudes towards mobile games

According to the core GameTrack survey, the number of people who play games on their mobile devices continues to rise. In the first quarter of 2015, 50m people in France, Germany, Spain, and the UK played mobile games. On average, these mobile gamers devote 4.8 hours per week to games on mobile devices, or a little more than half an hour every day.⁵¹

Mobile games complement games on consoles and PCs. More than four in ten mobile gamers also play on consoles and on average they spend over 12 hours every week playing games. Use of multiple platforms can be complementary and cater to different motivations. While users can play console games on a big screen (a motivation for play on consoles amongst 48% of console and mobile gamers), they also like playing games in short bursts on the move (a motivation for playing mobile games for 49% and 54% of the same group respectively).⁵²

In addition, the availability games that are free to download is an important factor that motivates people to play on their mobile devices according to 51% of these respondents.⁵³

Based on the responses to the freemium survey extension, 55% of people who played mobile games downloaded a mobile game in the past three months. This corresponds to approximately 21m people in total across the four markets.⁵⁴ Pricing strategies affect how people choose which games to obtain. 54% of mobile gamers have downloaded a free or a freemium game in the past three months. Only 8% of mobile gamers downloaded a paid game.⁵⁵

Figure 7: Share of mobile gamers who downloaded a game in the past 3 months, N = 3,728

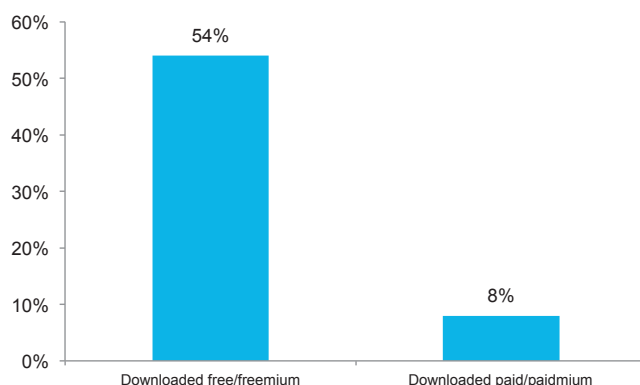


Figure 8: Number of free / freemium games downloaded in the past 3 months, N = 2,234

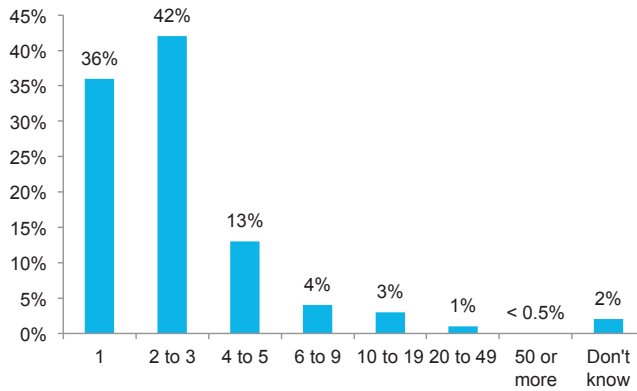
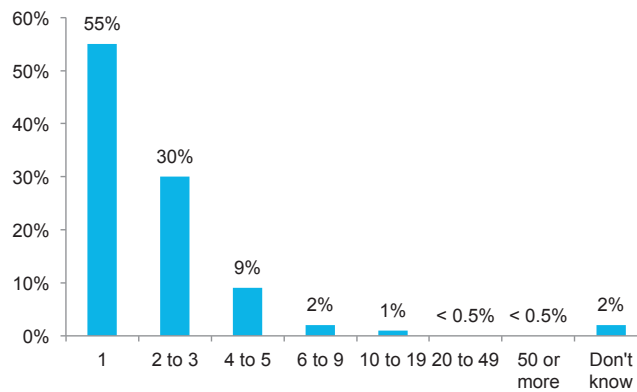


Figure 9: Number of paid / paidmium games downloaded in the past 3 months, N = 353



Free games improve consumer choice by allowing people to try multiple games for free. 62% of those who acquired a free or a freemium game downloaded more than one game, and on average acquired three games without upfront payments. A smaller proportion acquired multiple paid or paidmium games: 42% of the people who acquired a paid game downloaded more than one title during that period.

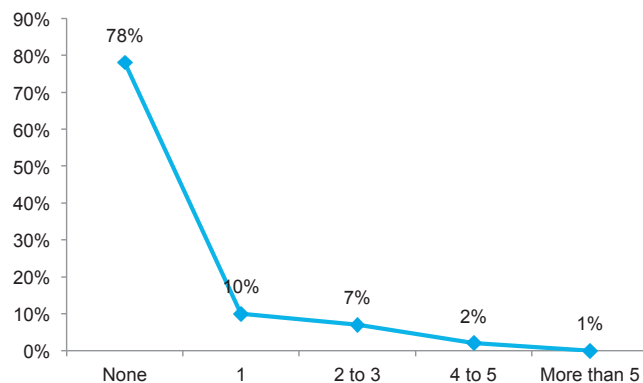
The overall reach of free and paid mobile games is not comparable; the proportion of gamers who downloaded paid or paidmium games was substantially smaller than of those downloading free or freemium games. The number of consumers who downloaded free/freemium apps reached nearly 21m in total across the four markets. In contrast, around 3m, or seven times less, people obtained a paid/paidmium game.

50% of respondents who play mobile games indicated that they played at least one of the 15 leading games included in the survey, with 46% having played one of the nine freemium games shown.⁵⁵ This result shows how well-recognized the top games are. Candy Crush Saga, Clash of Clans, and The Sims represented the games with the largest numbers of players. Conversely, **half of mobile gamers had only played titles that were not on the list of top grossing and most popular games. This implies that the attention of consumers is not concentrated only among a few titles but rather dispersed throughout a broader base of games.**⁵⁷

5.2 Few players make in-app purchases

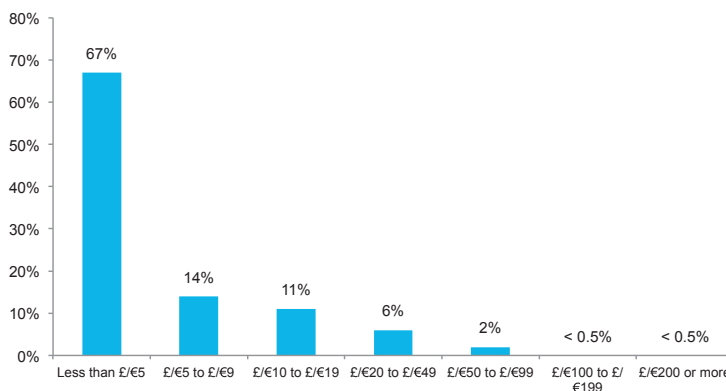
A majority of players do not pay for mobile games. During the three months prior to the survey, 78% of mobile gamers did not make any in-app purchases in freemium games. This translates to 22% of players making an in-app purchase in at least one game among the games they played. As gamers often play more than one title, the share of paying customers can be much smaller for individual companies and games. For example, approximately 4% of King’s monthly unique users made in-app purchases in its games as of December 2013.⁵⁸

Figure 10: Number of freemium games in which in-app purchases were made over the past 3 months, N = 3,728



Of those who paid money in a freemium game, 67% estimate that they spent less than €/\$5 on in-app purchases over the previous three months. The average spend of paying users during that period reached €/\$9.^{59,60}

Figure 11: Money spent on in-app purchases within freemium app games in past 3 months, excl. no spend and “Don’t know”, N = 788

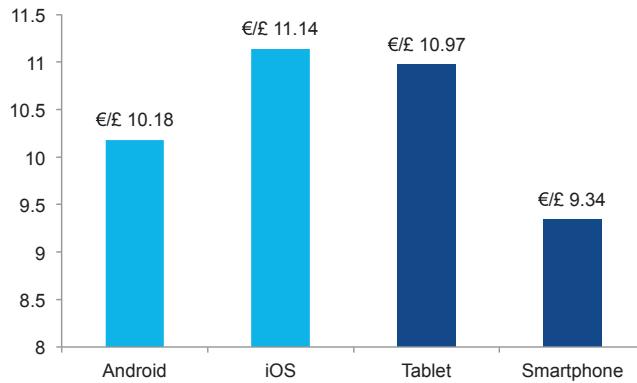


The survey asked players about their activity over the period of three months to capture, in a longer period, an activity that tends to happen infrequently. A conversion of the three-month responses into monthly estimates reveals the magnitude of spending on a more relatable scale. A majority of paying gamers estimate that they spent on average less than €/\$1.7 per month on in-app purchases; the monthly average of the estimated spend across the whole period was €/\$3.

Spending on in-app purchases is concentrated into a few games for each paying gamer. Of those who made an in-app purchase in a game, nearly half made it in only a single game (this corresponds to 10% of total gamers as shown in Figure 10).

On an individual basis, the proportion of mobile gamers who spend on in-app purchases is relatively low and the amount of money they estimate to spend is also low. This finding illustrates why obtaining large audiences is important for game developers. Small payments from a small share of players can amount to significant revenues if the base of players is large enough. Operating the freemium model with limited audiences, for example because of an upfront charge, would be less feasible as the small percentages of paying gamers would not be able to generate enough revenues to cover the costs of developing and providing the games. This would likely decrease the number of available games and decrease the consumer choice.

Figure 12: Average claimed spend within freemium games by paying gamer over the past 3 months, by platform used, N = 900



Players with iOS devices are more likely than Android users to make an in-app purchase in freemium games. The survey found that 27% of players with iPhones or iPad made a purchase, compared to 19% of Android smartphone or tablet users.⁶¹ Players with iOS devices (€11.1) also tend to spend more than Android (€10.2) users on individual basis. However, in aggregate game developers are likely to obtain higher revenues from Android users due to their wider install base.⁶²

5.3 Awareness of in-app purchases is strong

People are aware of in-app purchases both at the time of purchase and during the progress of the game. In a list of 15 popular app games across the freemium and paid segments of the market, 70% of those who played any of the 9 freemium games shown said that these apps contained the option for in-app purchases. Those who said that an app did contain in-app purchase options were asked whether they were aware of this when they acquired the game; 67% of them were aware of the existence of them at the time of download, 22% were not aware and 11% could not remember whether they were aware at the time of download.⁶³

Figure 13: Awareness of existence of in-app purchases at during gameplay among players of the 9 named freemium games, N = 1864

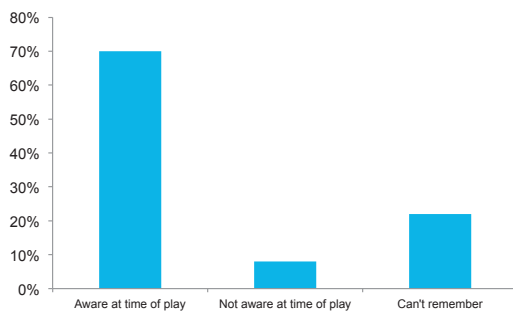
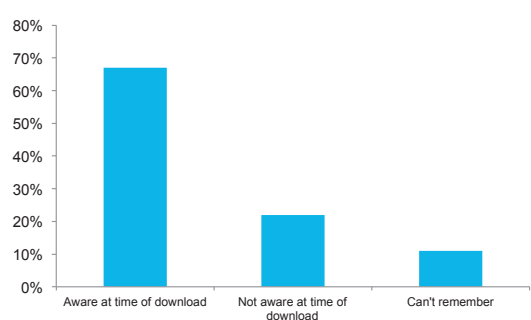
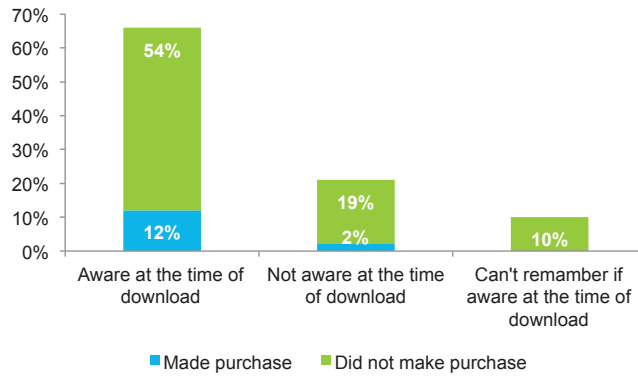


Figure 14: Awareness of existence of in-app purchases at the time of download among those currently aware of these options, N = 1378



The survey results suggest that people make informed purchasing decisions in the games included in this survey. Of those that played these games, only 2% made an in-app purchase, even though they were not aware of their existence at the time of download. This result does not imply that the purchases were unintentional. The players only discovered the possibility during the gameplay. In contrast, 12% made an in-app purchase and were aware of the possibility when they downloaded the game.

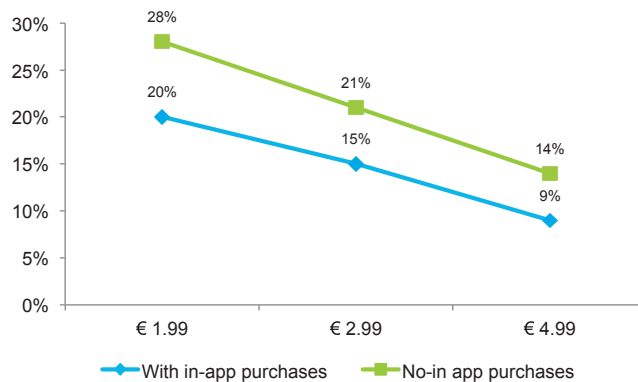
Figure 15: Awareness of in-app purchases at the time of download, and subsequent buying decision; based on respondents currently aware that the named freemium game contains in-app purchase options, N = 1378



5.4 Charging for games would shrink the market

The current model allows a large number of potential consumers to play for free. Developers make money from the fraction that chooses to pay. The ability to attract the wide audience is key for the industry’s viability and the free price point is its key enabler. Conversely, providing games for free allows consumers to play more games and increases their choice.

Figure 16: Would you download a game priced at different points (showing the % answering “yes” for the 9 named freemium games), N = 1920



The survey asked respondents about their ownership of games. If they did own any of the 9 freemium games shown in the survey, people were given a hypothetical scenario in which the games required an upfront payment rather than being available for free. They were asked to consider the three different price points that are common for paid games – €/£1.99, €/£2.99, and €/£4.99⁶⁴ – and for each game they played, indicate whether they would buy it for that price. They were also asked to consider these prices for hypothetical versions of the games, where in-app purchases would be completely removed.

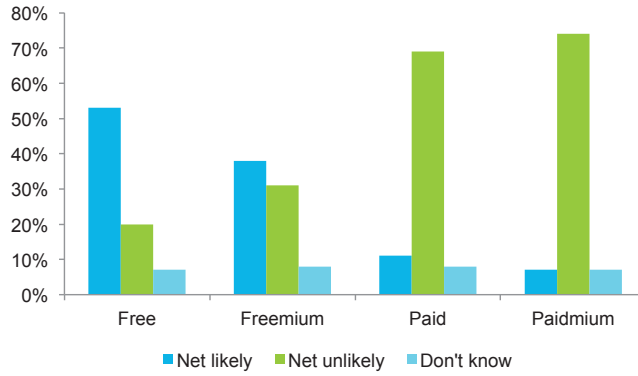
The responses suggest at least a 72% decrease in downloads if the game was priced at €/£1.99 and an 86% decrease if offered at €/£4.99, even when they are considering games that they are already playing. This means that the variety of games that consumers play would be reduced. It also implies that overall revenues in the industry would decrease, as download revenues would be unlikely to offset the fall of the in-app purchases. The unprofitability of games under this pricing model would reduce the number of new games being developed and therefore impact consumer choice.⁶⁵

5.5 Consumers are more likely to download free rather than paid games

Mobile gamers indicated that they will download new free and freemium games in the future. 53% of mobile gamers answered that they are likely to get a new free game in the future. Freemium games are the next most popular among the same group of respondents, 38% indicated that they would likely download specifically a freemium game in the future.⁶⁶

Consumer acquisition plans change for paid games, with more saying they are unlikely to download another. Only 11% of mobile gamers indicated they are likely to pay for a game upfront, and 7% are likely to pay upfront for a game that also contained in-app purchases.⁶⁷ In contrast, around 70% of them answered that they are unlikely to download such games.

Figure 17: Likelihood to download different types of app games in future, N = 3,728



6 Appendix: Methodology

6.1 Calculations of revenues and employment

The full-time employment results in this study were estimated based on information from 3rd party sources. The final estimates are a result of a series of multiplicative steps outlined below:

- The estimated employment figures from freemium games were derived using the “European App Economy” report from Vision Mobile. The Vision Mobile report considers all developers and support staff, including those working part-time or on non-game apps, and therefore its findings were adjusted to reflect the full-time employment in freemium games companies only. The survey results related to full-time employment, use of in-app purchases, and profit-orientation in the Vision Mobile report provided a basis for the adjustments.

The final results were calibrated using the market data provided by App Annie to Deloitte. The results represent the estimated number of full-time employees, both developers and support staff, employed by companies using the freemium model and headquartered in the country.

6.2 Consumer survey

This appendix describes the methodology and results of the Ipsos/ISFE Freemium survey about the freemium model in France, Germany, Spain, and the UK.

6.2.1 Survey methodology

Ipsos conducted the Freemium Consumer Survey in May 2015. It builds upon a GameTrack survey that Ipsos has administered quarterly for ISFE since 2011.

GameTrack fieldwork runs throughout the quarter. Two months per quarter, a sample of 1,000 adults aged 18+ is interviewed via a short offline survey (including questions relating to the games played by their 6-17 year old children), to provide data that is used to weight responses from a much more detailed online survey. The online survey is conducted amongst a sample of 6,000 internet users aged 6-64 years. 6-64 year olds represent the vast majority of all video games players. The online survey runs weekly throughout the quarter.

The GameTrack survey asks respondents about their general playing behaviour including platform uses, frequency of playing, and the value of game-related purchases. The GameTrack survey covers various game platforms, including PC or consoles, and is not limited to mobile.

The Freemium Consumer Survey is a one-time extension of the GameTrack survey. It was displayed for one month (May 2015) to GameTrack respondents aged 11-64 in France, Germany, Spain and the UK (from now also referred to as “four markets”) who indicated that they were mobile gamers. The results reported in this study consider only the respondents aged 18 and older.

The Freemium extension asked mobile gamers about their attitudes towards and awareness of the various business models. In particular, it explored:

- The number of game downloads based on their revenue model: free, freemium, paid, and paidmium;
- Spending behaviours in freemium, paid, and paidmium games;
- Awareness, both at the time of download and during gameplay, of existence of in-app purchases in popular games that the respondents had indicated playing;

- Responses to a hypothetical switch of popular games from freemium to a model that requires an upfront payment. The survey tested €1.99, €2.99, and €4.99 price points and options with and without in-app purchases;
- The likelihood of downloading other games with different revenue models.

List of games for testing the awareness of in-app purchases

Clash of Clans

Game of War - Fire Age

Candy Crush Saga

Candy Crush Soda Saga

Boom Beach

MARVEL Contest of Champions

8 Ball Pool

Hay Day

The Sims Freeplay

Despicable Me Minions

Minecraft *

Monopoly game *

Tomb Raider I *

Grand Theft Auto: Vice City *

The Room *

Blek *

** Denotes paid games*

7 Endnotes

- ¹ The developers interviewed in this study include both members and non-members of ISFE.
- ² Spotify (2015), "Information". Retrieved from <https://press.spotify.com/uk/information/>
- ³ Google (2015), "Our Mobile Planet." Retrieved from <http://think.withgoogle.com/mobileplanet>
- ⁴ <http://www.emarketer.com/Article/Tablet-Users-Surpass-1-Billion-Worldwide-2015/1011806>
- ⁵ Google's 'Our Mobile Planet', eMarketer
- ⁶ Tim Cook's speech at the Apple Worldwide Developer Conference, 2014.
- ⁷ AppAnnie
- ⁸ Morgan Stanley (2015). Research note on mobile gaming, 13 July 2015.
- ⁹ AppAnnie (2014), "The State of Play: A look at the growth of Google Play" and AppAnnie's private data provided to Deloitte.
- ¹⁰ Gigaom (2013), "Sizing of the European app economy". USD to EUR conversion done using the average exchange rate for 2013 based on Oanda.com.
- ¹¹ Boston Consulting Group (2014), "The Mobile Internet Economy in Europe". Retrieved from https://www.bcgperspectives.com/content/articles/telecommunications_digital_economy_devices_mobile_internet_economy/ USD to EUR conversion done using the average exchange rate for 2013 based on Oanda.com.
- ¹² AppAnnie (2014), "AppAnnie Index, Market Q3 2014"
- ¹³ AppAnnie data provided to Deloitte.
- ¹⁴ Yahoo! Finance. Retrieved 30 June, 2015.
- ¹⁵ Reuters (2013), "SoftBank buys \$1.5 billion stake in Finnish mobile games maker Supercell." Retrieved from: <http://www.reuters.com/article/2013/10/21/net-us-softbank-acquisition-idUSBRE99E01D20131021>
- ¹⁶ Softbank (2015), "SoftBank Purchases Additional Supercell Oy Shares". Retrieved from http://www.softbank.jp/en/corp/news/press/sb/2015/20150601_01/
- ¹⁷ <http://www.macmillandictionary.com/dictionary/british/freemium>
- ¹⁸ AppAnnie data provided to Deloitte.
- ¹⁹ Ipsos/ISFE Freemium survey.
- ²⁰ Candy Crush, iOS app store
- ²¹ King (2015), "First Quarter 2015 Financial Results". Retrieved from http://investor.king.com/files/doc_financials/2015%20Q1/King-Reports-First-Quarter-2015-Results_v002_I7awu4.pdf
- ²² Deloitte interviews with mobile game developers.
- ²³ Ghose and Han (2014), "Estimating demand for mobile applications in the new economy." [Journal of] Management science.
- ²⁴ King (2014), "Form F-1 Registration Statement under the Securities Act of 1933". Retrieved from <https://www.sec.gov/Archives/edgar/data/1580732/000119312514056089/d564433df1.htm>
- ²⁵ King (2015), "First Quarter 2015 Financial Results". Retrieved from http://investor.king.com/files/doc_financials/2015%20Q1/King-Reports-First-Quarter-2015-Results_v002_I7awu4.pdf
- ²⁶ Ipsos/ISFE Freemium survey.
- ²⁷ Amazon (2015), "3 Tips to Increase In-App Purchasing Revenue", <https://developer.amazon.com/public/community/post/Tx1YIID95K9ON1S/3-Tips-to-Increase-In-App-Purchasing-Revenue>
- ²⁸ Deloitte interviews with developers.
- ²⁹ Deloitte interviews with mobile game developers.
- ³⁰ Deloitte interviews with mobile game developers and reviews of videogames.
- ³¹ iOS app store and Google Play store. Retrieved on June 29, 2015
- ³² Deloitte analysis using data from AppAnnie , GMGC (2015) "Global Mobile Game Industry White Book 2015", Vision mobile (2015), "European App Economy 2015".

- ³³ Nesta (2014), "A Map of the UK Gaming Industry"
- ³⁴ Deloitte analysis based on employee LinkedIn information.
- ³⁵ Nesta (2014), "A map of the UK gaming industry"
- ³⁶ Amazon, "AWS Case Study: Supercell". Retrieved from <http://aws.amazon.com/solutions/case-studies/supercell/>
- ³⁷ Deloitte interviews with mobile game developers.
- ³⁸ Deloitte interviews with mobile game developers.
- ³⁹ Deloitte interviews with mobile game developers.
- ⁴⁰ Deloitte analysis based on employee LinkedIn information.
- ⁴¹ Deloitte analysis based on employee LinkedIn information.
- ⁴² Deloitte analysis
- ⁴³ Venture Beat (2015), "Wooga makes its next big bet on hidden-object mobile game Agent Alice". Retrieved from <http://venturebeat.com/2015/01/21/wooga-makes-its-next-big-bet-on-hidden-object-mobile-game-agent-alice-exclusive/>
- ⁴⁴ Deloitte interviews with mobile game developers.
- ⁴⁵ Nesta (2014), "A Map of the UK Gaming Industry"
- ⁴⁶ Deloitte (2013), "Enabling a world leading digital hub"
- ⁴⁷ UK Government (2013), "Tech City celebrates third anniversary as new figures show economic success story ". Retrieved from <https://www.gov.uk/government/news/tech-city-celebrates-third-anniversary-as-new-figures-show-economic-success-story>
- ⁴⁸ European Commission (2014), "European Cluster Panorama 2014." Retrieved from http://ec.europa.eu/enterprise/initiatives/cluster/observatory/cluster-mapping-services/cluster-mapping/cluster-panorama/index_en.htm
- ⁴⁹ Past GameTrack surveys can be found at <https://www.ipsos-mori.com/researchspecialisms/ipsosmediact/customresearch/Gaming/GameTrack.aspx>
- ⁵⁰ Ipsos (2014), "GameTrack survey Q1 2015."
- ⁵¹ Ipsos (2014), "GameTrack survey Q4 2014."
- ⁵² Ipsos (2014), "GameTrack survey Q4 2014."
- ⁵³ The extrapolation from survey sample to the country population was done by Ipsos.
- ⁵⁴ Ipsos / ISFE Freemium survey.
- ⁵⁵ Full list of games included in the survey is available in the appendix.
- ⁵⁶ Ipsos/ISFE Freemium survey.
- ⁵⁷ King (2014), "Form F-1 Registration Statement under the Securities Act of 1933". Retrieved from <https://www.sec.gov/Archives/edgar/data/1580732/000119312514056089/d564433df1.htm>
- ⁵⁸ Nominal figures shown were the same for UK respondents, but shown as '£' rather than '€'
- ⁵⁹ Ipsos / ISFE Freemium survey.
- ⁶⁰ Ipsos / ISFE Freemium survey.
- ⁶¹ Ipsos / ISFE Freemium survey.
- ⁶² Ipsos / ISFE Freemium survey.
- ⁶³ Nominal figures shown were the same for UK respondents, but shown as '£' rather than '€'
- ⁶⁴ Ipsos/ISFE Freemium survey and Deloitte analysis.
- ⁶⁵ Ipsos/ISFE Freemium survey.
- ⁶⁶ Ipsos/ISFE Freemium survey.
- ⁶⁷ Vision Mobile (2015), "Creating jobs and driving economic growth in Europe"

