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INTRODUCTION

One of the hottest social media apps these days is Paris-based BeReal. Released in 2020, BeReal encourages users to share a photo of themselves and their immediate surroundings at a random time every day.

BeReal is more than a fun app: It's also part of France's dynamic App Economy, which is helping to drive the country's job growth and the development of core IT skills. For example, as of May 2023, BeReal was looking to hire a QA Engineer to create automated testing for the company's iOS and Android apps.²

But the French App Economy is not just light-hearted entertainment. The Directorate General for Armaments (DGA), a directorate of the French Ministry of the Armed Forces, was advertising for an "Ingénieur développeur iOS ou Android cybersécurité." Indeed, such cybersecurity skills are essential to every part of the modern economy.

From social media to defense and health and manufacturing, and everything in between, the French App Economy includes 611,000 jobs. That's according to the Progressive Policy Institute's latest estimate, and it's up 41% from our pre-pandemic 2019 estimate.

None of these jobs existed 15 years ago, when Apple first opened the App Store on July 10, 2008, in the middle of the global financial crisis.³ Android Market (which later became Google Play) was announced by Google shortly after.⁴ These app stores created a new route through which software developers could write programs for smartphones. These mobile applications – called “apps” – could then be distributed to the rapidly growing number of smartphone users around the world.

The jobs generated by the app stores became an important part of the recovery from the financial crisis of 2008-2009, the subsequent economic expansion, and the response to the pandemic. More than that, app development and the app stores became a key route by which young people can develop tech skills and became an integral part of the digital economy.

This report describes some important aspects of the French App Economy. We also give some examples of App Economy jobs and skills development.

METHODOLOGY AND FRAMEWORK

For the past 10 years, PPI has done a series of reports on the App Economy around the world.⁵ The most recent one we did for European countries was the *Europe App Economy Update 2021*.⁶

For this report, a worker is in the French App Economy if he or she is in:

- An IT-related job that uses App Economy skills – the ability to develop, maintain, or support mobile applications. We will call this a “core” app economy job. Core app economy jobs include app developers; software engineers whose work requires knowledge of mobile applications; security engineers

who help keep mobile apps safe from being hacked; and help desk workers who support the use of mobile apps.

- A non-IT job (such as sales, marketing, finance, human resources, or administrative staff) that supports core app economy jobs in the same enterprise. We will call this an “indirect” app economy job.
- A job in the local economy that is supported either by the goods and services purchased by the enterprise, or by the income flowing to core and indirect app economy workers. These “spillover” jobs include local professional services such as bank tellers, law offices, and building managers; telecom, electric, and cable installers and maintainers; education, recreation, lodging, and restaurant jobs; and all the other necessary services.

We use public job postings from the Indeed real-time database of French job postings to estimate the number of core App Economy jobs, combining that with government estimates of the number of information and communications technology (ICT) professionals.⁷ A description of the basic methodology is found in “The App Economy in Europe: Leading Countries and Cities, 2017.”⁸ Then we use a conservative multiplier of indirect and spillover jobs to estimate overall App Economy jobs.⁹

RESULTS

Table 1 shows the results of the latest analysis. As already noted, the French App Economy includes an estimated 611,000 jobs, including a conservative estimate of spillover jobs. This figure is up some 41%, since before the pandemic. (It must be noted that most statistical agencies adopted new forms of occupation classifications across this period that may have affected our estimates).

Table 2 shows our estimates of App Economy jobs by operating system. According to our estimates, the iOS ecosystem includes 358,000 jobs in France as of May 2023. The Android ecosystem includes 514,000 jobs in France as

of May 2023. (The two categories sum to more than the total number of App Economy jobs because many app developer jobs are in both ecosystems).

TABLE 1: FRANCE: ESTIMATE OF APP ECONOMY JOBS, MAY 2023 (THOUSANDS)

	2023	2019*	PERCENTAGE CHANGE, 2019-2023**
TOTAL APP ECONOMY	611	434	41%

* Revised from published data

** Potentially reflects changes in official occupational categories

Data: International Labour Organization, Indeed, PPI

TABLE 2: FRANCE: ESTIMATE OF APP ECONOMY JOBS BY OPERATING SYSTEM, MAY 2023 (THOUSANDS)

	2023
TOTAL APP ECONOMY	611
IOS ECOSYSTEM	358
ANDROID ECOSYSTEM	514

2023 figures potentially reflect changes in official occupational categories

Data: International Labour Organization, Indeed, PPI

CONTRIBUTIONS OF THE APP ECONOMY TO GROWTH OF JOBS AND SKILLS IN FRANCE

Figure 1 compares the number of jobs in the French App Economy with the net increase in all jobs since 2008, when the app stores came into existence. This is a legitimate comparison because the number of App Economy jobs in 2008 was zero.

We can see from Figure 1 that the total number of jobs in the French economy increased by roughly 2.6 million since 2008. From that perspective, the 611,000 French app economy jobs account for roughly 23% of the total net gain in jobs over the past 15 years, including the pandemic.

Qualitatively, this suggests that the growth of the App Economy has played an important role in France's economic growth over the past 15 years. That makes sense, given how much time people spend on their smartphones using mobile applications. According to the latest report from data.ai, French residents spend just under 4 hours per day on mobile applications.¹⁰ That's up from roughly 2.7 in 2019, a roughly 45% increase. With so much consumer time and money being devoted to apps, it's not a surprise that the App Economy is so critical to growth.

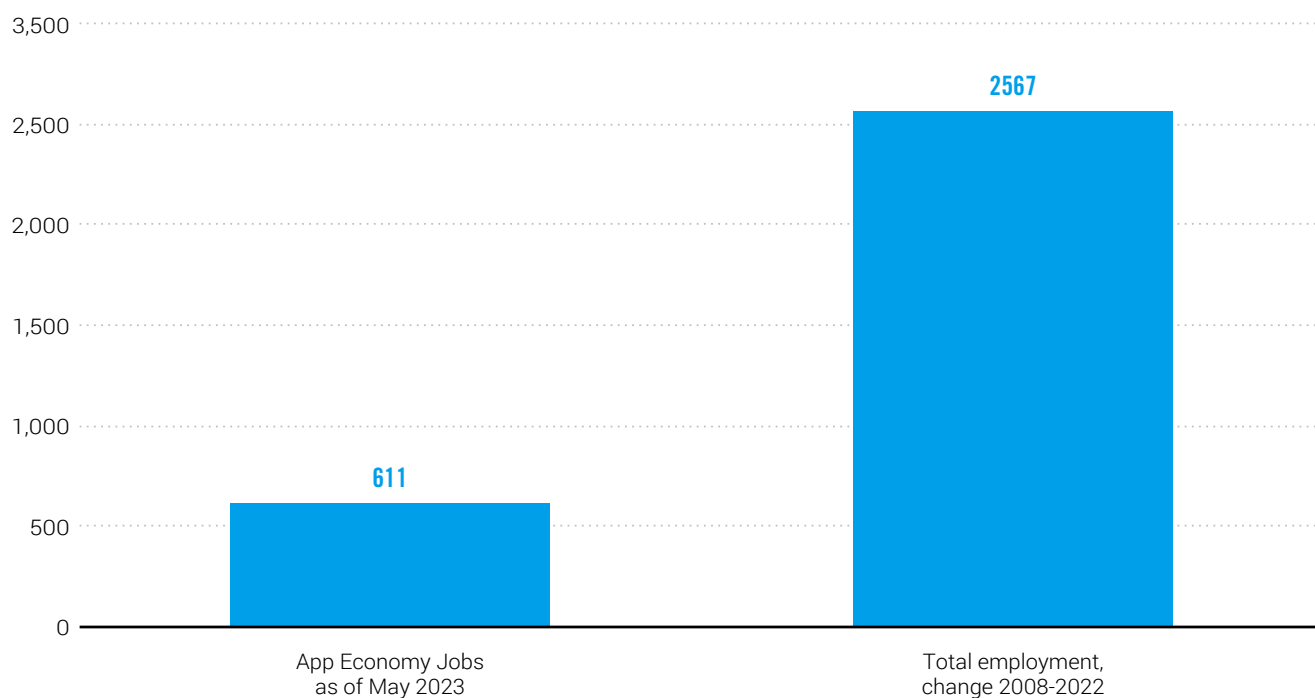
But there's another aspect of the App Economy that is often overlooked: The role of mobile app development and the app stores in providing a route into the digital workforce for people who come from varied backgrounds. While much app development is associated with large organizations, it's still easy for individuals and small groups to create new apps that can be accessed nationally or globally through the Apple App Store or Google Play.

In some cases, the new app can be very successful, like BeReal. Or it might languish without downloads, or have moderate success. But no matter what, the mere fact of creating a new app that is widely available through the app stores becomes a mark of skill and experience that opens other doors. "Start your own app, you get wider experience," says Charles Mellier, one of the creators of Hika, the top app for finding hiking trails in France. "It's a plus when you look for another opportunity."

At the same time, the app stores have been investing in improving the skills of local app developers and the quality of apps. Mellier notes that the Hika team received regular calls from Apple to give feedback on Hika's product roadmap and specifications.

Putting together a comprehensive list of app development resources is beyond the scope of this paper. But one example is that developers with iOS apps have opportunities to request one-on-one online consultations with Apple technical experts.¹¹ Apple also runs Developer Academies in Italy and several other countries. Google Play Academy provides free online courses for app developers.¹² And while not strictly apps-focused, Google offers Startup Accelerators in various locations.

A related issue is the ability of the app stores to open doors for groups that are otherwise underrepresented in the digital economy. For example, official data shows that women make up only 21% of employees in ICT professional occupations in France (Table 3). That's slightly better than Germany, but slightly worse than the United States. We do not have direct evidence of the demographics of app developers, but the app stores accept all apps that meet requirements, without bias. Apple Entrepreneur Camp, an immersive technology lab for underrepresented founders and developers, offers dedicated cohorts for founders and developers who are female and have app-driven businesses.¹³

FIGURE 1: FRANCE APP ECONOMY GROWTH COMPARED TO OVERALL JOB GAINS (2008-2022) (THOUSANDS)**TABLE 3: GENDER IN ICT PROFESSIONAL OCCUPATIONS**

	INFORMATION AND COMMUNICATIONS TECHNOLOGY PROFESSIONALS	
	(SHARE OF WOMEN IN OCCUPATION)	YEAR
UNITED STATES	25%	2022
FRANCE	21%	2021
UNITED KINGDOM	20%	2022
GERMANY	18%	2022

Source: Bureau of Labor Statistics (U.S.); International Labour Organization; Office for National Statistics (U.K.); Federal Office of Statistics (Germany); PPI calculations

EXAMPLES OF THE FRENCH APP ECONOMY

This section illustrates the variety of App Economy workers in the French economy as of May 2023, in addition to the social media and defense examples mentioned at the beginning of the report. As of early 2023, Voodoo, a well-known video game developer and publisher based in Paris, was looking for a Unity Developer to help develop blockchain applications for mobile games available on iOS and Android. Similarly, TapNation, a Paris-based tech startup founded in 2019 and specializing in mobile gaming, was looking for a Unity Developer with experience releasing games on both Android and iOS stores.

Maincare, a software provider for French public hospitals and state-run health authorities, was hiring iOS or Android Developers in Besançon, near the border with Switzerland. The consulting firm Capgemini was looking to hire iOS or Android mobile developers to work on an industrial application intended to configure and install electrical equipment. The position would be based out of Grenoble. Contentsquare, a NY-based digital analytics firm, was looking for

an Android software engineer in Lyon, an iOS software engineer in Paris, and a Senior Android software engineer, also in Paris. Air France was looking for an iOS developer in Toulouse who was a beginner or experienced in iOS mobile development.

Almond, based in Sevres, was looking for an “ethical hacker” to carry out security audits in various areas, including native mobile iOS and Android applications. Back Market, a Paris-based company which calls itself the world’s leading refurbished electronics marketplace, was seeking a Senior Frontend Engineer working with the company’s B2B and B2C iOS and Android applications. And the list of French App Economy jobs goes on and on.

CONCLUSION

Fifteen years after the Apple App Store and Google Play first opened, they are still filling an essential role, driving job growth in France, building skills, and opening tech doors to underrepresented groups. Hopefully the next 15 years will bring the same success.

ABOUT THE AUTHOR

Michael Mandel is Chief Economist of the Progressive Policy Institute, and **Jordan Shapiro** is Director of the Innovation Frontier Project.

Notes and References

- 1 With research assistance from Damian Ghigliotti.
- 2 According to the job posting, the job could be remote, but French or U.K. locations are preferred.
- 3 "The App Store Turns 10," Apple Newsroom, July 5, 2018, <https://www.apple.com/newsroom/2018/07/app-store-turns-10>.
- 4 "Google Play," Wikipedia, last modified May 16, 2023, https://en.wikipedia.org/wiki/Google_Play#.
- 5 Countries we have published App Economy reports for include the United States, the countries of the European Union, the United Kingdom, Canada, Mexico, Argentina, Brazil, Chile, Japan, Korea, Australia, Vietnam, Thailand, Indonesia, and India. We have analyzed China's App Economy but not published it because of data issues.
- 6 Michael Mandel, "Europe App Economy Update, 2021," Progressive Policy Institute, May 25, 2022, <https://www.progressivepolicy.org/blogs/europe-app-economy-update-2021/>.
- 7 Indeed, which bills itself as "the #1 job site in the world," offers a searchable continually updated database of job postings in France on fr.indeed.com as well as similar databases for more than 60 other countries. For France, the government estimates of information and communications technology professionals are drawn from the International Labour Organization databases.
- 8 Michael Mandel and Elliott Long, "The App Economy in Europe: Leading Countries and Cities, 2017," Progressive Policy Institute, October 2017, https://www.progressivepolicy.org/wp-content/uploads/2017/10/PPI_EuropeAppEconomy_2017_.pdf. Some pandemic-related updates to the European methodology can be found here: <https://www.progressivepolicy.org/blogs/europe-app-economy-update-2021/>
- 9 Based on government data, we make the reasonable assumption that each core App Economy job corresponds to one indirect App Economy job in the same organization. Next, we make the very conservative assumption that each core or indirect App Economy job generates 0.5 spillover jobs in the relevant geographic area.
- 10 "State of Mobile 2022," data.ai, accessed May 2023, <https://www.data.ai/en/go/state-of-mobile-2022/>.
- 11 "How to Participate in Office Hours," Apple Developer: Ask Apple, accessed May 2023, <https://developer.apple.com/events/ask-apple/office-hours/>.
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