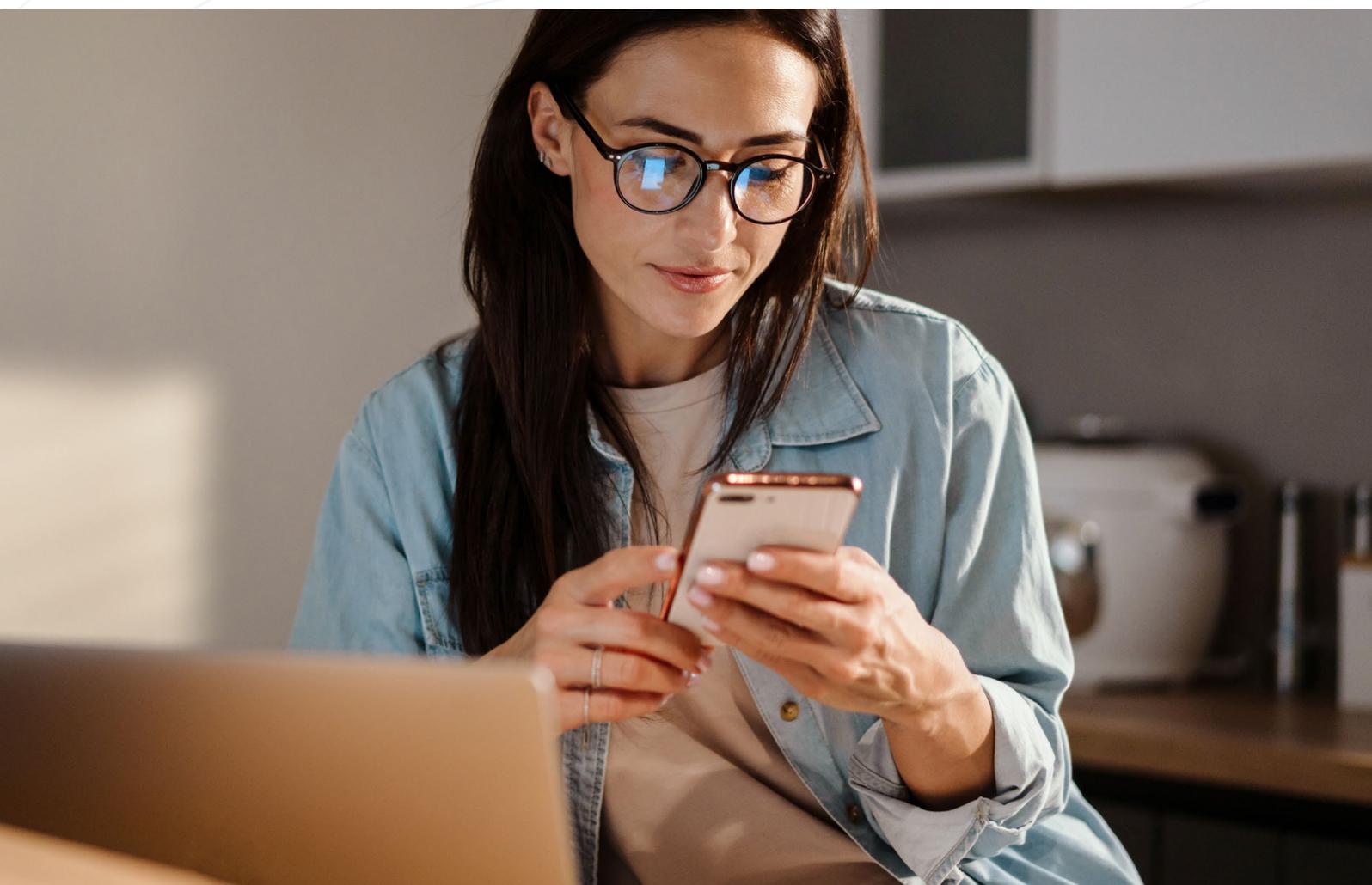


# Must-have technologies

for mobile app development  
in 2024



2023/2024

IT LINK

# Editorial

As a tool to interface with customers, keep operations running smoothly, or leverage new revenue sources, mobile apps have proven their worth. Understanding this, many companies have seized the opportunity to put out their own apps. At the end of 2022, the Google Play Store had over 3.5 million apps and Apple's App Store more than 1.6 million<sup>1</sup>.

However, it is one thing to take on the challenge of creating and launching a mobile app that matches user needs. Doing it successfully is another matter. Over 1 million apps get poor quality ratings, with Google Play especially burdened with rising numbers of inferior products<sup>2</sup>. This represents a huge risk for the firm behind the app. What if your product lacks quality or is insufficiently user-friendly, intuitive, or safe to win over users? After investing all that time and money, you may be forced to go back to the drawing board or scrap the project altogether.

With these issues in mind, we want to share our convictions concerning mobile app development with you. What are the right questions to ask before getting started? What critical points need to be considered? How do you choose the technology that best meets your own needs and those of your users? What are the essential steps? And, obviously, how do you find the right partner?

This white paper contains answers to all the questions you are asking (or will be shortly) as you contemplate designing and launching a mobile app.

Happy reading!

**David Hervé,**

Connected Mobile Applications Unit Director, IT Link Group



<sup>1</sup>Statista Research Department, 26 Apr. 2023, "Number of apps available in leading app stores as of 3rd quarter 2022"

<sup>2</sup>[https://www.ecranmobile.fr/Google-Play-souffre-d-applications-de-mauvaise-qualite-\\_a73200.html](https://www.ecranmobile.fr/Google-Play-souffre-d-applications-de-mauvaise-qualite-_a73200.html) (French)



# CHOOSING YOUR TECHNOLOGY: **WHAT ARE THE ESSENTIAL CRITERIA?**

Putting out a mobile app is a no-brainer for many companies. They are used by businesses in the B2C and B2B segments to deliver a host of services and may be the primary point of contact with customers and users<sup>1</sup>.

Embarking on the development of an app is something that requires careful consideration, since the choices you make at the outset will have short-, medium- and long-term consequences for your budget, the number of personnel involved, future developments and new functionalities, but also for user uptake of the service and, ultimately, for the reputation of your company. You can't afford to leave anything to chance. So, what are the key criteria when choosing the right technology?

<sup>1</sup><https://www.arcep.fr/cartes-et-donnees/nos-publications-chiffrees/barometre-du-numerique/le-barometre-du-numerique.html> (French)

# The big challenge for apps: providing an optimal user experience

In B2C and B2B alike, a company needs to address three main challenges when developing a mobile app. Its product should:

- Offer a smooth, user-friendly experience
- Be fast and quick to navigate
- Be compatible with the vast majority – or ideally all – of the main brands and operating systems (OS)

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**Pro tip:** business apps tend to change less than consumer apps. A major reason for this is that they are typically developed in tandem with business lines and representative users, which, combined with the change management process, means that customer feedback on corrections or functionalities is very rare. Because of this, it is critical to stay attuned to how the app is being used and make upgrades so that its functionalities stay current and the human-machine interface (HMI) does not become obsolete.

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# Ask the right questions before starting out

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When launching a mobile app project, the question of how the product is going to be used is critical. The answer will dictate functionalities, guiding you to the most suitable technologies. Several key questions should shape your choice:

- **Who are the target customers?**
- **What equipment are they using (iOS / Android / Windows – Smartphone / Tablet)?**
- **What functionalities do they expect?**
- **Will the app need to access the phone's functions, such as GPS, camera or Bluetooth?**
- **How much data is going to be processed?**
- **What is the proposed budget, not just for design and development but also for future maintenance and upgrades?**

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## “It's got to be intuitive!”

**Pro tip:** To be sure to develop an app that meets user needs, a user-centered design phase is a must. Usability and design questions need to be raised from the get-go: a mobile app simply has to be intuitive.

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The skillset of the inhouse development and maintenance team is another important area to consider. Ideally, you should choose a technology that your teams know inside and out, to safeguard the app's continuity over time while integrating the specifics of the mobile ecosystem. Environments and languages are evolving at lightning-fast pace, requiring firms to maintain a constant technology watch and upskill regularly to avoid being left behind – the equivalent of a death sentence in the world of tech. The old saying, “If you're not moving forward, you're going backward,” still rings true today.

Once the foundations have been laid, your selection of development technology will depend on the answers to the questions above. You will need to choose from one of the following options:

- **Native development:** specific development for each mobile OS platform (iOS, Android) in a native programming language (Swift for iOS, Kotlin for Android)<sup>1</sup>
- **Web technology:** responsive web content development using a language such as HTML, CSS, or JavaScript. Access via the phone browser through a direct link or PWA
- **Hybrid technology:** a combined native/web app featuring integrated web development, allowing the product to be deployed in stores like native apps. Widely used solutions include React Native and Ionic/Angular
- **Cross-platform technology:** development uses a shared platform so native apps can be generated across all device types. Flutter, Unity, and MAUI<sup>2</sup> are leading cross-platforms

<sup>1</sup>Older native technologies, such as Objective-C for iOS and Java for Android, are no longer used for new developments but may be used to maintain older apps.

<sup>2</sup>.NET MAUI replaced Xamarin in November 2021





## MUST-HAVE TECHNOLOGIES AND KEY TRENDS:

### **ANALYSIS**



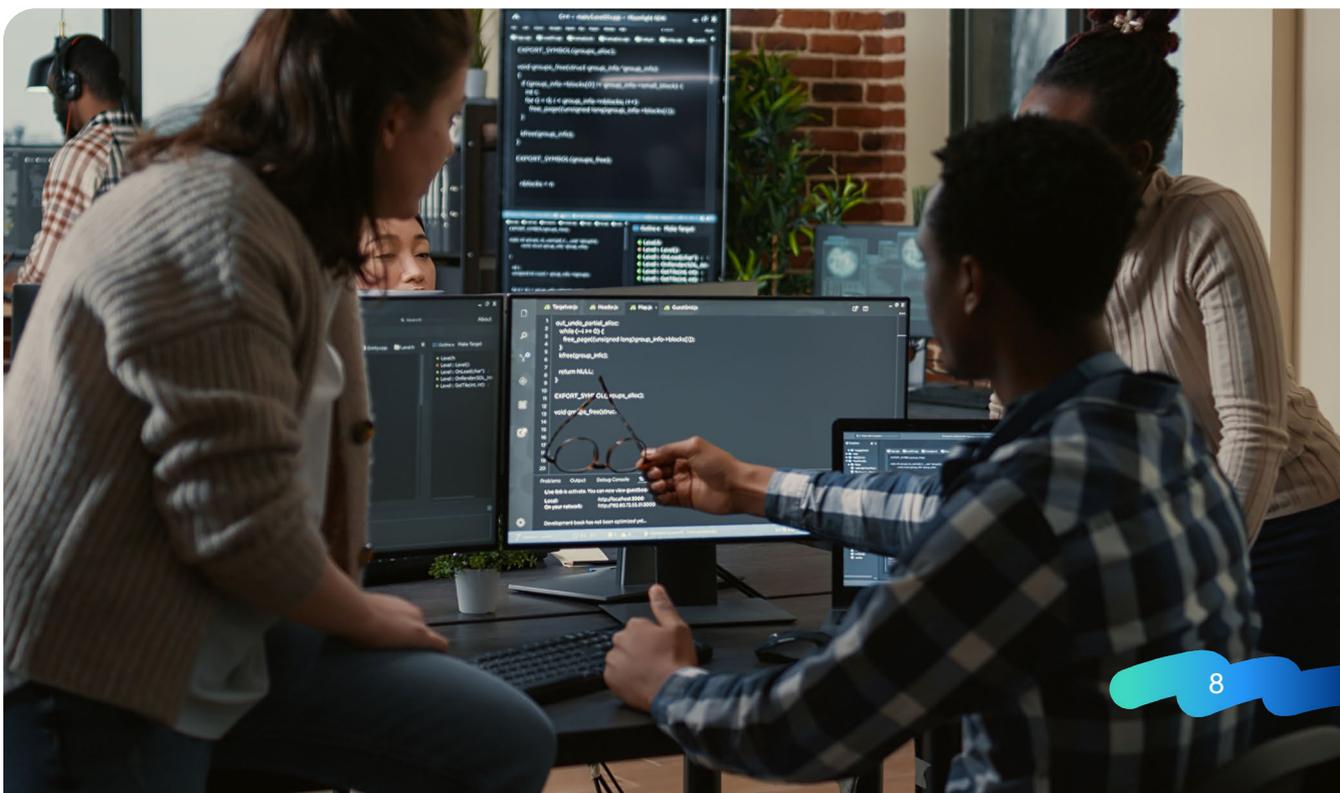
# 2

Finding a technology that meets the needs of all targets is hard. So don't skip the preliminary discussion stage, as this will show the way forward for the service delivered by the app. A good partner will ask the right questions, support customers by organizing workshops, and be a source of ideas during this strategic phase.

# Native technologies for optimized usability and performance

Using a native technology is a great way to go if you are looking to put out a fast, high-performing application whose look and feel match the device's original design, especially if the app uses internal functions such as GPS, camera, or Bluetooth. Of these, **Swift** for iOS and **Kotlin** for Android are the frontrunners. The former is recommended and supported by Apple, the latter by Google. That means, among other things, that the two firms provide technical support and regular updates for these technologies, offering priceless security to the project's developers and backers in the event of a failure or if errors need to be managed.

From a project management perspective, it is important to bear in mind that using native apps will require you to run two projects side by side, if you want an app that is compatible with both OS. You will have to be ready to involve a larger number of partners and expect a longer development lead time. As always, let your choice be dictated by your needs: what are the expected functionalities? What is the lead time before the apps can be made available? What is the budget for the build and run phases?



# The rise of cross-platforms: Flutter



Among the technologies that have created the biggest buzz, especially in the last couple of years, Google's **Flutter** has carved out a place as a go-to platform and is challenging native technologies such as Kotlin and Swift.

As a cross-platform technology, its key feature is its ability to employ a single codebase, with 90% or more of the code reused to create apps that can be deployed on Android and iOS. Flutter products deliver performances that are very close to those achieved with native languages, operating identically to native apps and offering modern, seamless UI.

A second key benefit is that Flutter makes it easy to integrate OS-specific features. Native functions are directly accessible through the SDK<sup>1</sup>, and UX<sup>2</sup> best practices are upheld for each platform.

Flutter is also backed by a massive developer community. In 2023, over 6 million developers published more than 1.1 million apps. Flutter is in the top three for OpenSource project contributions to GitHub<sup>3</sup>, ensuring that the technology is always evolving, while remaining easy to access and use, thanks to a suite of modern, seamless tools, including the Hot Reload function. Another plus is Google's expertise, not only when it comes to quickly integrating services (Firebase, Analytics, etc.) in documentation, but also in change management.

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**Pro tip:** We estimate that working with a cross-platform technology such as Flutter can slash development and maintenance time by 30% compared with developing two apps in native environments. Using one technology for just one project that can be deployed across two targets = only one development team = improved efficiency!

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Google recently put out desktop and web compatible versions of Flutter, with more mature versions expected towards the end of 2023.

<sup>1</sup>Software development kit

<sup>2</sup>User eXperience

<sup>3</sup><https://twitter.com/imafiguresk8r/status/1676495213475536896>

# FOCUS | Use case

## Your app is obsolete. Do you update or redevelop?

By Charlotte Cottez, Head of Mobile Projects

This question has come up for some of our customers. Sometimes they have been surprised by the answer.

Olnica, which is part of Socomore Group, is a French firm specialized in product traceability. Customers use its innovative proprietary detector technology based on molecular taggants to spot fakes.

Several years ago, Olnica began developing two prototype native mobile apps (Android and iOS) to run the detector via Bluetooth. After the company that originally developed these apps shut down, Olnica was looking for a new partner that could take over desktop and mobile developments.

Unfortunately, an audit of the native codes revealed multiple problems:

- **The Android app used an obsolete language and needed to be upgraded**
- **An issue with the architecture meant that maintaining the app would be complicated**
- **The two apps did not behave identically and did not build in the same features**

It might have been possible to reuse the code, but that could have proven costly over the long term. To ensure better maintainability and bring costs down, IT Link proposed to overhaul the application completely using Flutter.

Since Bluetooth was the app's critical functionality, a Proof-of-Concept (PoC) was developed using Flutter to ensure that existing performances were preserved at the very least.

The Flutter PoC recorded outstanding post-optimization performances. An identical user experience was provided on iOS and Android platforms. Implementation issues with the Android native version were cleared up, and the connection was stabilized.

Our monitoring tools, including Jira, kept the customer in the loop on developments, and our automated crash and error detection processes kept customer/developer discussions efficient and functionality-focused.

**What comes next?** IT Link is continuing to upscale the PoC in order to finalize the app, which will soon be available on app stores, meeting Olnica's expectations to the letter.

## Boosting 3D and VR performances with Unity

Developing an interactive virtual reality or augmented reality 3D app requires a unique kind of technology offering adaptability and high performance. Unity, which was first unveiled at the Apple Worldwide Developers Conference in 2005, has established itself as a key technology in this area. Besides being supremely flexible, it supports multi-platform compatibility, making it possible to develop apps that are simultaneously compatible with iOS, Android, Windows, Mac, and Linux. Its many attributes make it a preferred choice for game developers, and it boasts a large, collaboration-focused community. Lots of learning resources and mutual help platforms are available to support newbies and seasoned users alike.

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**Pro tip:** We recommend Unity particularly for serious game apps. For a more conventional 2D app, it may make more sense to opt for a native or cross-platform technology. Unity involves more complexities, longer development lead times, and requires skills that are in shorter supply on the market. Always remember to think long term. Apps need to evolve, be adjusted, and receive regular updates.

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ADDRESSING AN  
ESSENTIAL OPERATIONAL  
REQUIREMENT:

**SNCF's SurTE app**

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- **Name:** SurTE (an acronym that also sounds like the French word for safety when pronounced)
- **Goal:** Alarm and safety solution for SNCF customer relations team members
- **Target:** Ground staff and onboard agents
- **Technology:** Kotlin
- **Notable achievements:** Silver medal, 2022 Republik Group Security Awards, in the "**Large Group Projects**" category<sup>1</sup>

### The need

France's national railway company, SNCF, wanted a business app through which customer relations team members could send a distress signal, connect with SNCF's national security command center and get law enforcement backup if needed.

### Constraints

- **24/7 availability**
- **There needed to be certainty that a one-step process would activate the alarm and contact the command center**, no matter where the alert was triggered, including in areas with no coverage or when going through a tunnel.
- **Limited drain on the device's battery**

### The response

An app developed in Kotlin for 20,000 team members using Android phones supplied by the company.

To promote an environmentally responsible approach and minimize the impact of its projects, IT Link does its best to ensure maximum backwards compatibility with hardware, which lessens the need to renew equipment <sup>2</sup>.

For this reason, the company, which provided the first version of the app in 2016 (then 100% Java and offering minimum compatibility with Android 4), elected to update the product regularly and gradually replace Java with Kotlin. As a result, the app was compatible with Android 13 in 2023 and is scheduled to be compatible with Android 14 by the year's end.

<sup>1</sup><https://www.republikgroup-securite.fr/post/troph%C3%A9es-s%C3%A9curit%C3%A9-2022-le-palmar%C3%A8s>

<sup>2</sup><https://ecoresponsable.numerique.gouv.fr/publications/referentiel-general-ecoconception/>



## Q&A with Hugues Vandekerckhove

Safety Expert, Stopover Business Area, Product Owner, SurTE2 app  
SNCF – Traveler Safety Division

### → What was the background for the SurTE launch?

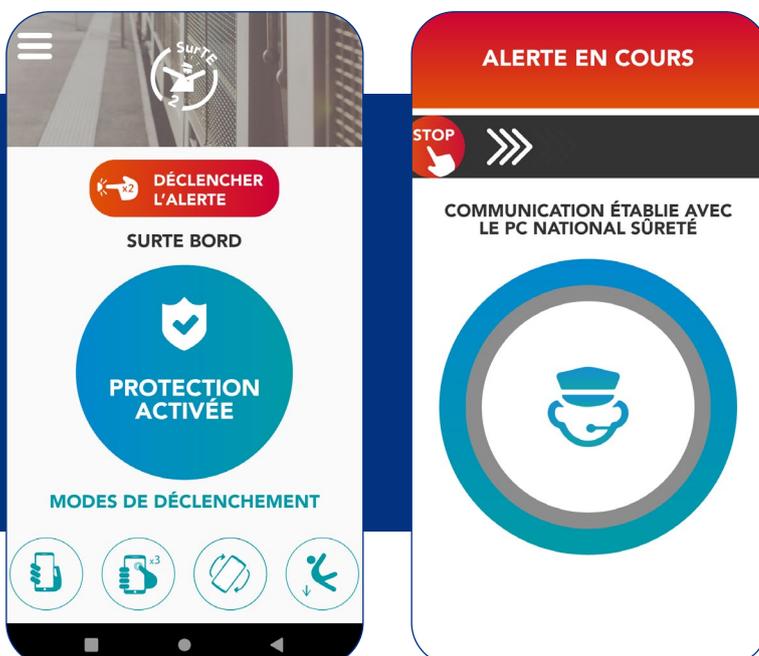
In the mid-2000s, on more than one occasion our personnel found themselves in serious danger onboard our trains. To tackle this issue, we set up an alarm system that was activated by an emergency help button. The foiled attack in 2015 on a Thalys train marked a new turning point. We needed a fast, ultra-reliable tech solution that would do an even better job of keeping our people safe both onboard and trackside.

### → How did the project unfold?

In early 2016, we identified IT Link as a preferred partner to support us in the project. The firm already had two ready-to-deploy solutions we were interested in: an emergency call solution and another one featuring a triangular comms system linking the staff member to the security command center and law enforcement. This resulted in the 2017 launch of SurTE1, which was deployed to around 11,000 team members on our high-speed, regional express, and intercity trains. In 2020, we held a call for bids to launch a revamped version of the app featuring innovative new features. This led us to collaborate once again with IT Link on SurTE2, which came out in September 2021 and which is used by 19,000 customer relations team members.

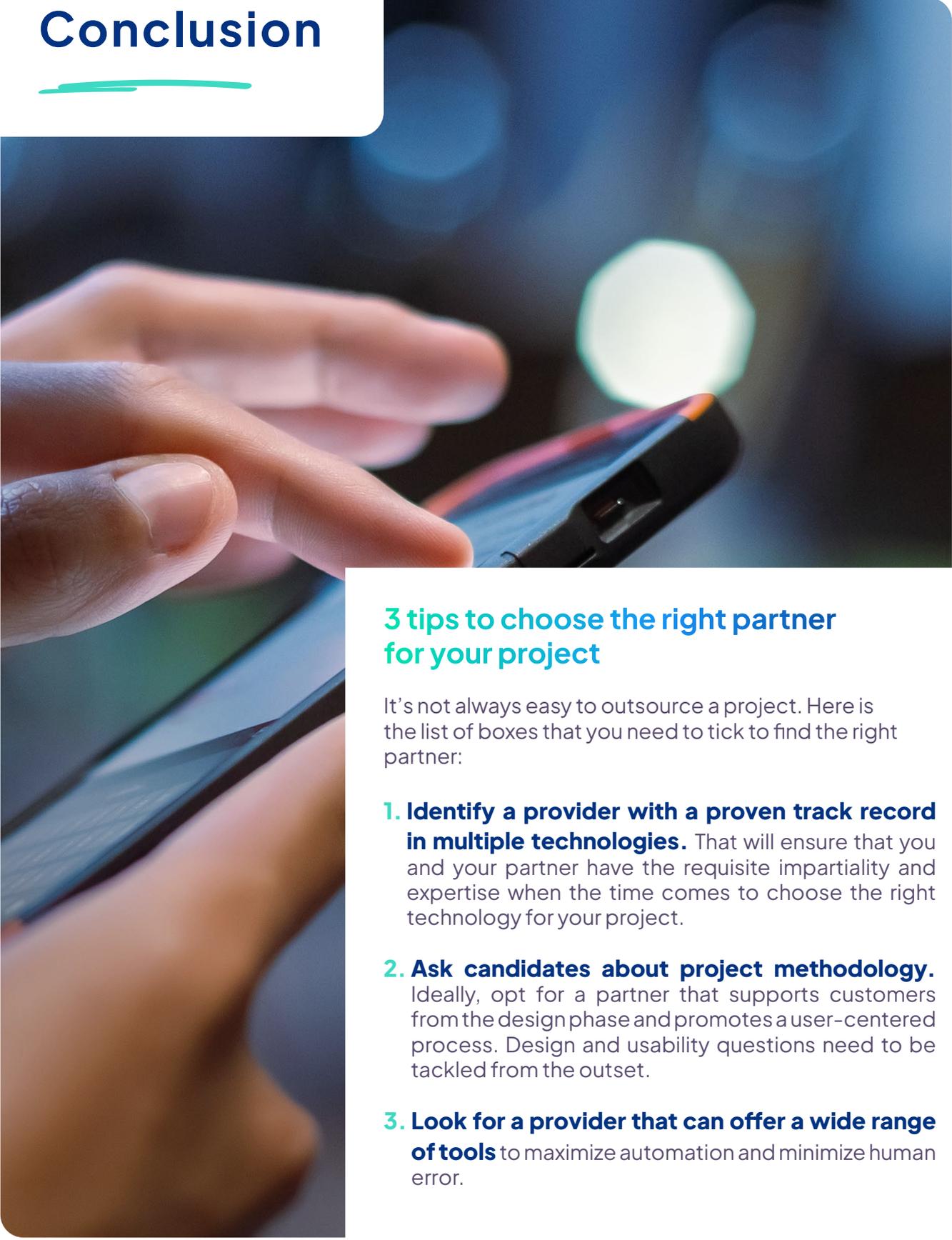
### → How would you describe your collaboration with IT Link?

Our collaboration is much more than a partnership. It's a relationship of trust. We know each other well. We get on well. Everything is very transparent on both sides. That allows us to move forward quickly and efficiently. Our app is evolving all the time to meet staff needs more effectively – and that's our priority. If all of our service providers were like IT Link, it would be great!



SurTE is an alarm system for onboard agents and ground staff. Developed by IT Link in partnership with SNCF's Safety Division, it features an advanced mobile app that provides accurate outdoor and indoor geolocation positioning, high-availability infrastructure and a monitoring center that is connected 24/7 with the SNCF Safety Division's information system.

## Conclusion



### 3 tips to choose the right partner for your project

It's not always easy to outsource a project. Here is the list of boxes that you need to tick to find the right partner:

- 1. Identify a provider with a proven track record in multiple technologies.** That will ensure that you and your partner have the requisite impartiality and expertise when the time comes to choose the right technology for your project.
- 2. Ask candidates about project methodology.** Ideally, opt for a partner that supports customers from the design phase and promotes a user-centered process. Design and usability questions need to be tackled from the outset.
- 3. Look for a provider that can offer a wide range of tools** to maximize automation and minimize human error.

# Checklist for a successful project

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Clearly identify the expected functionalities

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Identify the target platforms

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Identify future users and get them involved in a user-centered design process

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Choose the technology that offers the best performance/cost control tradeoff

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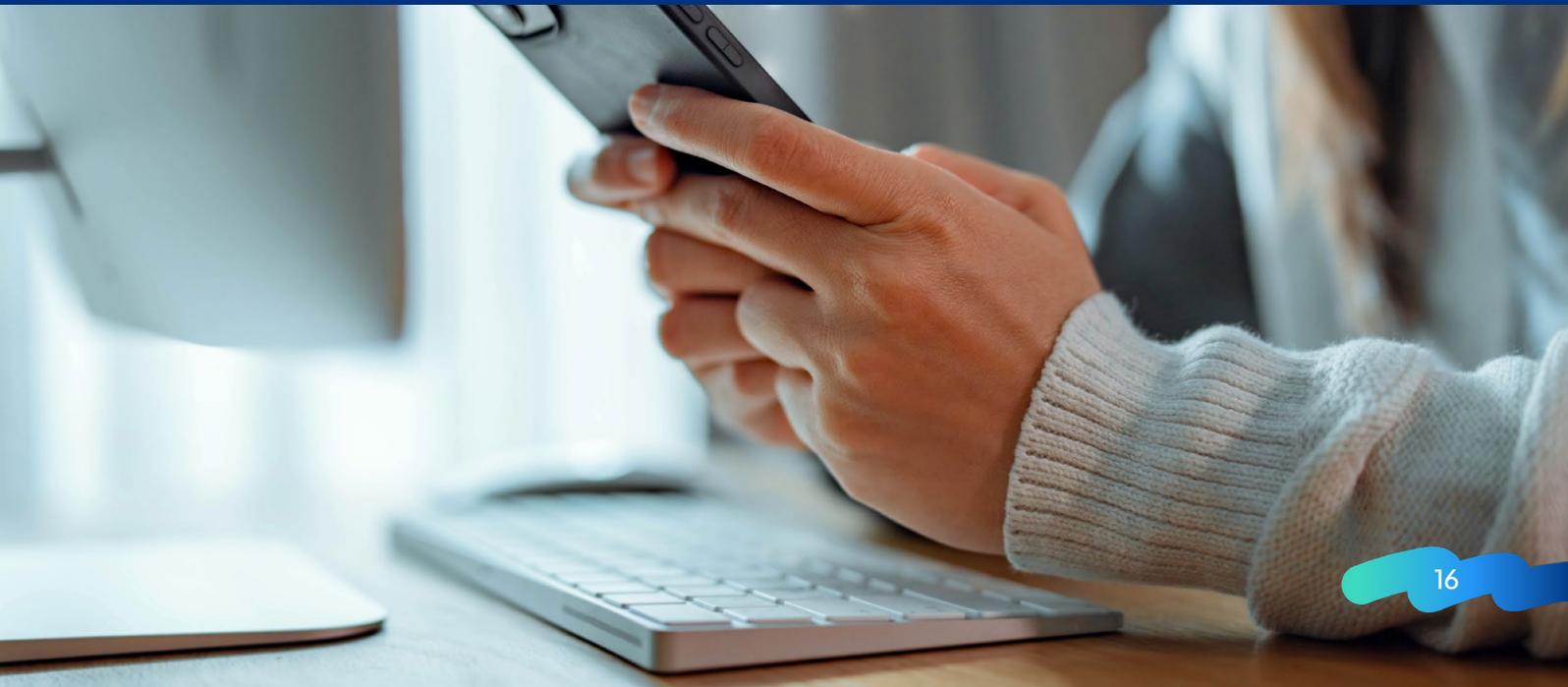


Choose a company with a thorough command of proven, secure development processes

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Advance plan the organization of maintenance and the roles that the provider and customer will play



# IT Link, the first digital services firm to be specialized in connected systems



8

centers of expertise

775

employees

85%

engineers

14

offices in Europe,  
Canada and Morocco

For over 35 years, IT Link has been helping firms to navigate their digital transition. Through sensors, business apps and other solutions, we bring our technical skills and creativity to bear to optimize our customers' processes.

Leveraging their expertise, our team members take on the big tech challenges of our time, right across the value chain, from embedded technologies to business apps.



# IT'LabMobile: IT Link's connected mobile app development lab

IT Link's 20-person mobile development unit has proven expertise in developing and maintaining mobile apps. Our designers, developers, lead developers, architects, product owners, validation engineers, and project leads work together to provide outstanding services and technologies to customers while living by the Linker Team Principles<sup>1</sup>.

The Mobile Unit also relies on IT Link's IS, Web & Cloud and Data Enhancement Units to carry out backend developments aimed at harnessing mobile app data and providing a high-value added connected service.

## Preferred technologies

**Native languages:** Kotlin (Android), Java (Android), Swift (iOS), Objective-C (iOS)

**Hybrid and cross-platform languages:**

- Flutter
- Ionic / Angular / Typescript
- React Native
- Unity 3D
- MAUI (which replaced Xamarin)

The IT'LabMobile follows a six-stage methodology to take apps from design through to the run phase.

- 1. Assess the existing situation** to prepare an accurate description of the system and challenges linked to the product
- 2. Make a recommendation on the architecture** to suggest the best compromise solution that will be effective while meeting the project's technical constraints and controlling build and run costs
- 3. Establish a production roadmap**
- 4. Conduct development and testing in a User Acceptance Testing environment**
- 5. Bring online and start run phase**
- 6. Support Run: TMA<sup>2</sup>**

<sup>1</sup><https://www.itlink.fr/ebooks/linker-teams-from-agile-project-team-to-agile-multi-project-organization>

<sup>2</sup>Tierce Maintenance Applicative: set of processes that provide maintenance and corrections over time to ensure that the service continues to work smoothly

**IT LINK**