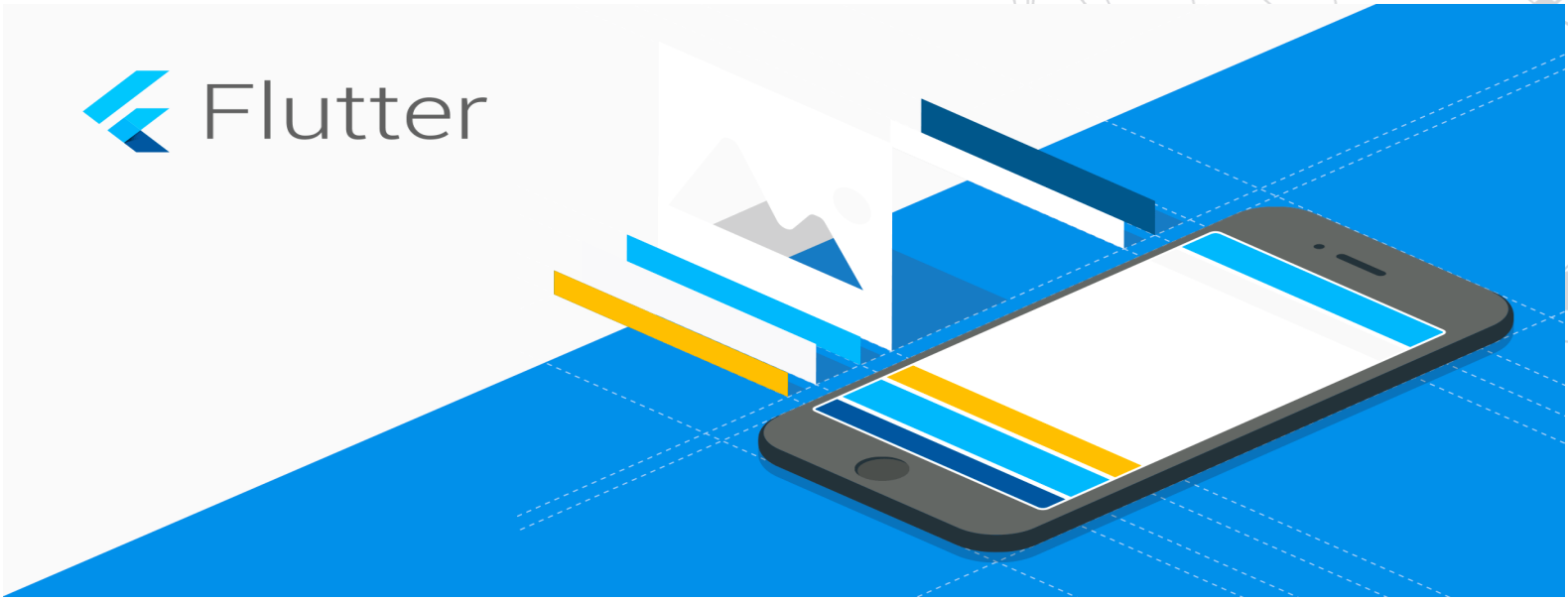

Tech Insight: Flutter

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Since the inception of mobile access to technology just a few years ago, the development of the mobile computing environment continues to explode. Government, industry, education, and every day consumers now depend on the use of mobile apps to manage assets, resources, and communication. It's now crucial for software applications to operate on a variety of platforms (desktop, laptop, mobile) and from the most widely used mobile operating systems, the iPhone (iOS) and Android.

With no end in sight to this *flutter* of movement from one device to another, is it any surprise that a new app development solution is named Flutter! Flutter is a popular open-source mobile user interface (UI) framework that is used by developers to enable apps to *cross-function* across a variety of platforms and operating systems. The prized developer features of Flutter have contributed to its adoption by numerous enterprises, from the world's largest online commerce company, Alibaba; and the multinational conglomerate that specializes in Internet services and products, Tencent Holdings Limited; to Google Ads and App Tree; and even the musical, Hamilton! This *Tech Insight* provides an overview of Flutter, its benefits and challenges, examples of apps developed with the tool, and the future of Flutter.

Overview

Flutter was created in 2015 by Google, the Big Four technology firm, alongside Amazon, Apple, and Facebook. Google released a more stable version recently, in December 2018. As a cross-platform app development tool, Flutter enables developers to use a single codebase to develop an app that is supported by Android, iOS, or Windows. This is a faster way to build mobile apps, since normally, each platform needs unique types of coding for application development; with Flutter, programming is performed once.

While the Flutter software development kit (SDK) contains all the libraries, tools, and documentation required to build an application, it is an accessory and not a programming

language. Flutter uses the Dart language, a Google built language that is similar to the Java and C# programming languages, and it is not restricted to use on mobile operating systems.

The Dart language has the lowest learning curve, and the documentation makes it easy for movement in the development process. This language makes cross-platform app development easier for a greater class of developers. The way Dart is compiled makes Flutter efficient and more accessible to customization. Tim Sneath, Google's group product manager for Dart, states, "The problem we're solving is the problem that most mobile developers face today. As a developer, you're forced to choose. Either you build apps natively using the platform SDK, whether you're building an iOS app or an Android app. And then you've got to build them twice."

The special features of Flutter are many, including "hot reload" and "debug," which enable apps to run as fast as 60 frames per second (FPS), an impressive measurement for display device performance. Developers have also emerged with greater application programming interfaces (APIs) for Firebase, Google's mobile platform, along with greater windows development, and programming language internationalization.

Benefits and Challenges

Developing an app with Flutter is fast and cost effective from an app owner's point of view. Flutter speeds up the mobile app development process, reduces the cost of app production, and helps a developer's team to build an app user interface (UI) with smooth animations. The benefits of utilizing Flutter for app development include the following:

Hot reload: When changes are made to an application, they are readily available to the developers, which makes the process efficient and less time-consuming. When something does fit or looks perfect in the app, hot reload allows developers to quickly fix mistakes and allows developers and designers to collaborate effectively.

Useful for Minimum Viable Product (MVP) **Delivery**: If a developer is looking to build quickly for stakeholders, it takes less time to use Flutter to build native looking apps for both iOS and Android. An MVP is the version of a new product that allows a development team to collect the maximum amount of information from stakeholders, with the least effort.

Less coding: The Dart programming language is an object-oriented programming language. This means that because it allows hot reload, Flutter does not need to code a new program if changes are made.

Cross-platform development: Coding is done only once and then the same code can be used in another platform, if desired. Additionally, Flutter is the only access to development in Google's Fuchsia platform, the operating system that is expected to replace Android in the future. All apps for the Fuchsia OS will be written using the Flutter SDK.

Widgets: Flutter app development has the benefit of having many widgets that are natural in appearance and fast. Flutter has a range of different widgets that perform well and can be customized based on need. The widgets are unified for all platforms and layouts.

Different themes: For the most part, the themes of the same app are different for iOS and Android. The difference is not the theme color of design, but instead, Flutter allows developers to enter different themes while coding for both platforms.

Although Flutter holds many benefits, it is still new, and is not without limitations. The following are key challenges to note.

- When developing instant or progressive web apps, where applications need to be small in size, apps built with Flutter are larger than native apps.
- Because Flutter is new, it does not yet support all the native libraries in its repository. Thus, apps that need uncommon native libraries can make the process difficult. In this scenario, developers will need to add custom-made platform channels, which can prove timely.
- The need for applications to communicate hardware via Bluetooth can be built separately for both iOS and Android and added to the Flutter app; however, this is time-consuming.
- Flutter can only be used for mobile now. It is not available for web browsers or Apple and Android TVs.
- Many platforms allow continuous integration (CI) to iOS and Android apps, but Flutter does not.
- Flutter may not be the best choice for developers who are looking for maximum flexibility. The tool has libraries, but not a wide range of them; many useful libraries are still unavailable, even though Google has included the most common ones. If a developer wants to utilize any of the unavailable libraries, they will need to create them on their own, a time-consuming process.

Examples

Cross-platform development toolkits are winning over the developer community. Reusable blocks of UI, reactive performance, and code usability on multiple platforms are some of the reasons why cross-platform app development frameworks are gaining ground.

Developers are building cross-platform native apps with little or no help using Flutter, so the framework has been delivered to startups for app development. The following represent a few innovative apps built by Flutter.

- **Google Ads** allows users to view campaign ads on Android smartphones; it showcases details, such as real-time alerts and notifications, and the ability to add, edit, and remove keywords.

- **Birch Finance** is a rewards app that enables users to find the card that suits them best through analyzing spending patterns.
- **Hamilton**, the hit Broadway musical, utilizes Flutter for users to gain access to exclusive daily news, videos, and lotteries for popular sites.
- **Hookie** is a social app built using Flutter allows its users to share posts, track social media, and manage several social activities in one place.
- **Reflectly,** a lifestyle app, is driven by artificial intelligence. This app is a journal and mindfulness app that allows its users to create stories in a personal journal and unlock advanced statistics and personal, actionable insights.

Flutter appears to have potential for continued growth in mobile app development, in terms of scale, idea, category, and type of content.

Conclusion

Is Flutter the future of app development? When it comes to building applications for iOS and Android platforms, a compromise is created between quality and productivity. However, the introduction of Flutter appears to help eradicate the issue. The Department of Veterans Affairs (VA) uses many open source SDKs and they are all listed on the Technical Reference Model website to develop products. Currently, Flutter is not utilized by VA. It may be advantageous for VA to consider using this tool because it contains the utilities and interfaces needed to develop, install, run, and test native applications that appear on iOS and Android.

Although a fresh tool, Flutter has received plenty of recognition, and its future seems to be bright. Even though Flutter is still regarded by some developers to be in its developmental phase (a potential risk), it should not take Google long to launch its next stable version of the framework.

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