Xamarin Helps Applied Research Save Lives with First Responder App

First Bomb Squad Incident App in the Country

Applied Research Associates (ARA), an employee-owned scientific research and engineering company, is dedicated to producing innovative solutions that tackle critical problems in national security, infrastructure, energy and environment, and health solutions.

Founded in Albuquerque, New Mexico, in 1979, ARA has grown steadily and now has offices throughout the United States and Canada, and now more than 1,400 employees, most of whom have advanced degrees in engineering and the physical sciences.

Highlights

- 50% faster app development using Xamarin, thanks to 70% code-sharing across device platforms and using the Xamarin Component Store.
- Lead developer had mostly a Java background, but easily made the transition to C# and Xamarin.
- Applied Research now in a position to build additional apps much more quickly thanks to reusable components.
When first responders get word of a bomb or suspicious package, lives can depend upon the rapid collection and distribution of incident-related information. ARA’s Autonomy and Security Group created a solution to do just that. Its Instant Notification System, created for the U.S. government’s Combating Terrorism and Threat Support Office’s Tactical Support Working Group (TSWG), enables bomb squad technicians to quickly and effectively notify team members about suspicious packages or events over commercially available networks. The app also allows each technician to selectively receive events from other technicians utilizing their existing smart devices. This is the first app of its kind in the country.

After delivering a Java-based Android app initially, ARA was asked to create a new version for iOS. ARA needed a development platform that would enable swift development for both iOS and Android platforms.

ARA credits the Xamarin platform with making it easy to share code between the Android and iOS apps. Xamarin also simplified data integration. The SQLite library from the Xamarin Component Store enabled them to write database code once for both iOS and Android platforms. “We also used Xamarin for the session initiation protocol the app uses for authentication,” says Matt Fordham, Group Lead for the Autonomy and Security groups at ARA. “We integrated a Xamarin library that provides SIP for both Android and iOS versions.”

“Xamarin jumped out at us because it met all of our requirements for a cross-platform solution, and seemed the most mature.”

Jeremy Kolb
Software Engineer at ARA

The group was also able to pull in GIS code from an unrelated app it had developed and drop it in, unmodified, for use in the Xamarin-based iOS and Android apps.

Benefits

ARA benefits from using Xamarin include 70% code sharing between its Android and iOS app, 50% faster development time, cleaner code, and a competitive advantage for creating mobile apps.

“Once we learned we were doing the iOS version, we started splitting stuff out, and we went to Xamarin to fully take advantage of C# and code-sharing,” Kolb says. We estimate we were able to share about 70% of the code between our Android and iOS apps using Xamarin.”

“With our Android app running on Xamarin, we ended up with a very large portion of our logic that we put into a common library that we could then share between the two apps, which was very nice.”

Jeremy Kolb
Software Engineer at ARA

From Java to Xamarin

As ARA began its iOS version of Instant Notification System, it chose Xamarin as its development platform. “We considered options, including Ruby,” says Jeremy Kolb, Software Engineer at ARA.

As a first step the ARA team ported its Java-based Android app to into Xamarin, so it could benefit from cross-platform code sharing. The initial port took 6 weeks, with another 3 weeks spent re-architecting to maximize code-sharing with the iOS version. Development time for the iOS version took 4 months.
50% Faster App Development

The ability to share code across platforms, and the ease of working with Xamarin, combined with the efficiency of using C# instead of Java and Objective-C have helped ARA achieve faster app development.

The ARA team anticipates even a faster time to market with their next Xamarin-based app, for TSWG, already in process. “With Xamarin our development time could have been even shorter on the Instant Notification System,” Kolb says. “But this was our group’s first iOS app so there was some learning curve involved with iOS.”

C# Encourages Cleaner Code

ARA developers like Xamarin support of C# because they feel it leads to more efficient code. “While Java and C# are similar, I find C# to be a cleaner language,” Kolb says. “We were able to clean up a lot of idiosyncrasies from Java, things like replacing anonymous classes with lambda functions.”

Kolb also appreciated being able to use the same language for both Android and iOS development. “On the iOS side, Objective-C is nice, but I like the fact that with Xamarin we can stay within C#, using the same language for working on both platforms.”

Competitive Advantage

ARA feels it has gained a competitive advantage through its use of Xamarin. “The efficiency of Xamarin is making it easier for us to take on mobile projects,” Kolb says. “We know how quickly we can work, and how much easier it is— compared to using other solutions—for us to roll out the same app for different platforms.”

Fordham says Xamarin efficiency and code-sharing is already benefitting other projects at TSWG. New mobile application projects make use of GIS data and other elements that were included in the Information Notification System app.

“With Xamarin we can easily share code from one project to the next,” Fordham says. “This will mean an overall cost reduction for the subsequent apps because we can reuse code that we wrote for this app.”

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