Generate Android App

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This paper shows how someone with limited or no programming experience can generate an Android application in minutes without writing any code. The application, also called an APK file can be stored on your website or on an App store for download to an Android phone or tablet. You can distribute your Android app for free or sell it to users with device specific Serial Number activation.

Your application can be constructed from a variety of document types including a Video, PDF, List of PDFs, EPUB or collection of HTML files, images, scripts, etc. For example, assume you have created an eBook on your Mac or Windows computer using the standard EPUB 2 format. You can turn the eBook into an Android application with a few button clicks.

This paper shows how to turn an eBook into an Android app with a custom icon. Part 2 of this paper shows how to optionally apply protection and licensing features to your app. You will see how the same process can be applied to many popular document types you may already be using. The screen shots in this paper were mostly taken on a Mac, but everything looks and works essentially the same on Windows.

What You Need To Generate an Android App

You will need a Mac or Windows computer with the DocProtect application from Excel Software. DocProtect allows you to select your document, set a few options and then output a source folder holding the entire project code for an Android application.

Next, you will download and install Android Studio on your Mac or Windows computer. Android Studio is a free development environment from Google. It is the recommended environment used by Java programmers to generate Android applications. You won't be writing any code. You will simply choose one command to generate the finished APK file that is ready for distribution to users.







When you download and install Android Studio you might also need to install the Java runtime environment if it is not already installed on your computer. Excel Software has tested the process described in this paper on Mac and Windows computers, but Android Studio is also available on Linux and should work the same.

To ensure everything goes smooth, make sure you have the latest version of Android Studio that was 3.6.3 at the time this paper was written.

Some programmers use Eclipse with the ADT Plugin to develop applications. If you are a programmer, you can likely use the same generated source project files in that environment. Some customizations may be required that vary depending on what version of Eclipse you use. This paper assumes you are using Android Studio.

Generate Project Source with DocProtect

To produce an Android application you will start with video or EPUB file or perhaps a folder of HTML files. Using DocProtect, you will generate a Android Project folder of files for your application.

For this example, assume you start with an EPUB formatted document. EPUB is an international standard document format for an eBook that is well supported by Authoring tools and utilities. An EPUB file is typically presented within a reader program like iBooks on Mac or other readers on various platforms. There are several versions of the EPUB standard. DocProtect only supports EPUB 2.

Launch DocProtect. Use the **Select** buttons in the main window to add a path to your EPUB file, an icon file and output folder. To generate a Mac or Windows application from that EPUB file, you would simply click the **Build** button. The focus of this paper is to show how to create an Android app, so you can leave the Document Icon and Output Folder paths empty.

In addition to generating Desktop applications, DocProtect can generate applications presented within the SafeWebApp player or mobile apps. For both of these cases, a SWAD file is used. Notice the **Export SWAD** button and **Mobile** button on the main screen. You will soon see how both can be used.

A SWAD file is simply a container file holding an encrypted document and associated data. That document can be a video, PDF, EPUB, HTML folder or other document types.

The Android Project folder that you will soon generate contains a SWAD file that holds your original document.

The project also contains a SWAD viewer library, a licensing library and some interface glue code.

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You will need to setup a few

options before generating the application. Click the **Options** button and select the SafeWebApp panel. Notice the Document name is already defaulted for you. It indicates the name of the SWAD file that is stored inside your generated project files. Ignore the Default Host field since that does not apply. To complete the Image path, click the **Select** button and choose a JPG or GIF image the application can use as a splash screen on startup. Click **OK** to dismiss the Options dialog.

Click the **Mobile** button on the main DocProtect screen. Notice the Android radio button is selected and iOS is dimmed out. Type your domain name in the Company Domain field without any www prefix. Click the blue ? for a popup help screen that explains how Android uses this to uniquely name Activities in the generated source code.

Click the **Select** button and pick an image file for your application icon. For best results, the image should be exactly square and 144 x 144 pixels or larger. DocProtect automatically generates the various icon images needed for an Android project. If your icon does not completely fill the square region, the unused area should be transparent.

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Click the **Select** button at the bottom to locate an Output folder. A Project Folder of source files will be generated in this folder. None is selected in the License section, so license related options are all dimmed out. Click the **Generate** button to output the Project Folder of files. Your Android app is almost finished.

Generate APK with Android Studio

Launch Android Studio and click Open an existing Android Studio project from the Welcome screen. Locate and select your generated Project Folder.

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manifests

The Android Studio window has options for displaying and hiding various panels. As illustrated here, we are displaying the Project panel and have selected the main Java file for this project.

If you are not a programmer, you probably don't care much about the source code DocProtect generated for you.

A DocProtect generated project is assigned to use Gradle 3.4. That is significant because Gradle 3.6.3 introduced a bug that causes the build to fail. Notice the highlighted classpath shows that this project uses Gradle 3.4.0.

You may see a message urging you to upgrade to a newer version of

Gradle, but resist the urge or the Gradle bug may prevent your project from building properly.

To generate the APK file, choose the Generate Signed APK command from the Build menu.

Every Android application must be signed with a certificate that you can generate yourself. You will need to step through



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several screens to complete this process and generate the APK file. On the first screen select the APK radio button, then click the Next button.

Click the **Create New** button to create a new certificate and save it in a safe place. Use for this and any other Android applications that you may someday generate. Type appropriate information into the New Key Store dialog and click OK to create a KeyStore file. Notice how all the fields are filled in for you in the Generate Signed APK dialog.

Click the **Next** button and select release and set the V1 checkbox. Now click **Finish**. When finished building the project, Android Studio offers to take you to the folder that holds your shinny new APK file.

Your generated APK file is located inside the Project Folder, in the App folder, in the Release folder. It is named app-release.apk.

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Rename the APK file as desired, upload it to your website and alert the media.

Install and Run Your Android App

Assume you have uploaded your APK to your website. An Android user can simply type that URL into their web browser or click on a link on a page of your website that links to that file. Your APK file is automatically downloaded into the Downloads folder of their Android device.

Before installing, the user may need to enable "Unknown Sources" on the Security panel of the Settings application. Tap the application to install it and notice how your application icon has been added to the screen of your Android device.

The generated application normally starts with a Welcome screen with your splash image, a **License** button to activate the application and a **Start** button to present the activated application.

Since no licensing was applied to this application, the main application screen is presented. For an EPUB document the first page or chapter is presented. Tap the vertical dots at the top right of the screen to select **Contents**, **Previous Chapter** or **Next Chapter** commands to navigate through the book.

The Contents page shows links to each chapter in the book. The user can click a link to jump directly to that chapter. Slide your finger on the screen to scroll through the chapter while reading. Change between portrait or landscape view or use gestures like opening or closing your fingers to expand or shrink the displayed content.

The **Exit** button returns the user back to the Welcome screen.





Other Document Types

A similar process is used to create an Android application from other document types. Some specific differences are discussed here.

Some documents depend on Internet access even after the application has been installed.

<u>Video</u>

To generate an application from a video, first save the video as an MP4 document type. The Android OS is typically used on phone and tablet devices with limited memory. Depending on the Android OS and device, the practical size limit of a SWAD file is about 20 MB.

That memory limitation does not affect most document types other than videos. Compress your video to substantially reduce the size without much impact on quality for a small phone or tablet screen.

HTML Project

HTML files and related technologies like CSS, Javascript, image files and embedded videos can be used together to produce an interactive application.

DocProtect can combine a folder that contains the main HTML file that references other files and

folders within the main folder into a cohesive application. The Document path on the main DocProtect window references the main HTML file. All other files and folders within the containing folder become part of the application.

An HTML project may contain all of the resource files, so once the Android app is installed it can run without Internet access. Alternatively, the some of the content files can be stored on the Internet. This makes it possible to provide live content, dynamic data or to supply information to a website from within the application. This approach also allows videos to be streamed from the Internet making the app much smaller, faster to install and able to support large videos.

Web PDFs

The **Web PDFs** button presents a dialog to name and specify a URL for one or more PDF files that reside on a website. The generated SWAD file and associated Android App is very small and does require Internet access while it is being used.

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Software Activation	http://www.excelsoftware.com/download/software_activation.pdf
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Protect, License & Sell Apps	http://www.exceleoftware.com/download/protect_licence_cell_xoje_appc.pdf
QuickLicense and Safe Activation	http://www.excelsoftware.com/download/getting_started.pdf
Protect License Excel Workbook	http://www.excelsoftware.com/download/protect_excel_workbook.pdf
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Each PDF is given a nice presentation and user experience on the Android device without providing direct access to the PDF. Users cannot share the PDF outside of the app and do not need to individually download each file or get a PDF viewing application to display it.

If a single PDF is specified in the Web PDFs dialog, then that screen is presented when launching the Android app. If a list of PDF files is specified, then a menu of PDF names is presented when launching the Android app.

When the user clicks a title within the menu, that PDF is presented. The user can scroll within the PDF or enlarge or shrink it if desired. The **Exit** button returns the user to the menu screen where they can select a different title.

Customize Android Source Project

While the focus of this paper was to demonstrate how to create an Android app without programming, an Android programmer may not be able to resist the temptation to make a few customizations. This section will help guide the way so your efforts are more productive.

If you make coding changes to the generated project source files, you won't want to generate a new project from scratch each time you change your original document. DocProtect can output a SWAD file that can replace the SWAD file stored in the Assets folder of the generated project. After replacing that file, you will simply rebuild the APK file.

One customization a programmer might like to make is to include many different documents within the same APK and give the application a custom user interface. Store as many SWAD files in the Assets folder as you like.

Change the activity_main.xml layout file to select a specific document. Present that SWAD with the play function of the SwadRT class in the onStartClick function of MainActivity.java.

You may want to split a large video into multiple SWAD files. Alternatively, build a SWAD from an HTML file that links to one or more videos that reside on the web. That keeps your APK small and allows you to stream really large videos into your application.

Summary

This paper demonstrates how to build an Android application from various kinds of documents. It

uses DocProtect on Mac or Windows to generate a Project Folder containing the source code of the application. Next use Android Studio to generate an APK file ready for distribution.

In the interest of brevity, this paper did not discuss the important topic of protection and licensing. Without protecting an Android application and controlling on which devices it can be activated, a publisher cannot easily sell or control distribution of their work. Protection and licensing is the topic of *Generate Android App Part 2*.