

# Infringement of United States Patent number 6,826,744 by Samsungs' Android-Powered Smartphones

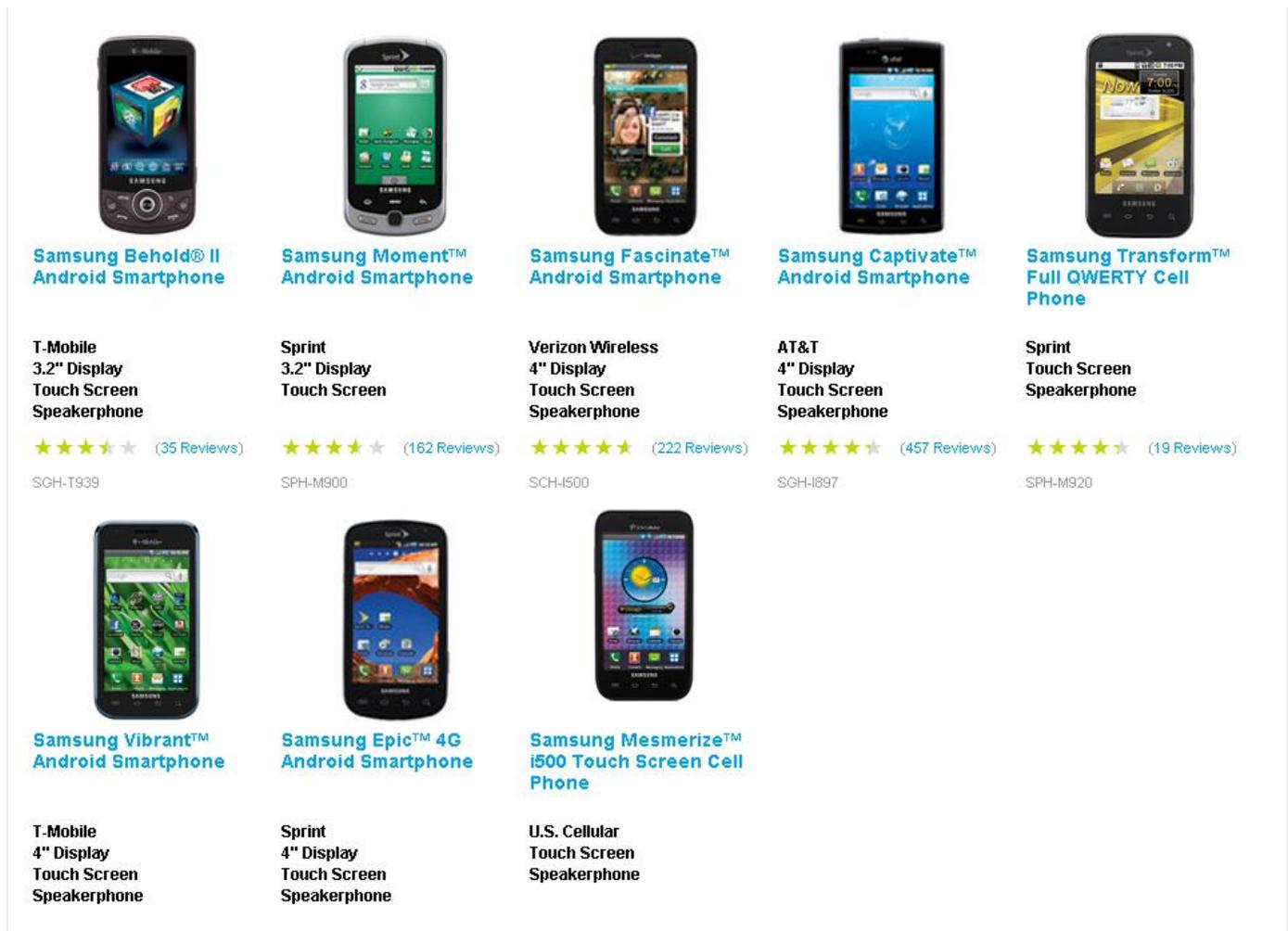


FIGURE 1 (List Samsung's Android-Powered Smartphones from the SAMSUNG.COM Website)

## SAMSUNG'S ANDROID-POWERED SMARTPHONES STANDARD APPLICATIONS INFRINGE

The Samsung Android-Powered Smartphones infringe claims of U.S. Patent number 6,826,744 because Android Framework standard applications are installed into these phones by Samsung during the manufacturing process (many of which are non-removable). The Smartphone is then imported into the United States containing these non-removable applications. These applications are developed using: **"A method for generating a computer application on a host system in an arbitrary object framework that separates a content of said computer application, a form of said computer application and a functionality of said computer application."**

Patent # 6,826,744 Claim Chart for the Android Framework

The Samsung Smartphones in Figure 1 are Android Powered SmartPhones. As such, they include the following standard Android apps:

- Dialer
- SMS
- Email
- Gmail
- Google Maps
- Navigation
- Internet Browser
- Contacts
- Calendar
- Phones
- Camera
- Market
- Alarm Clock
- Calculator
- Music Player
- You Tube Video Player
- Photo Album

These standard applications, many of which are non-removable, form the heart of the Smartphone. Without them, the phone will not operate and could not be sold in the U.S.

# Infringement of United States Patent number 6,826,744 by Samsungs' Android-Powered Tablet Computers



FIGURE 2 (List Samsung's Android-Powered Tablet Computers from the SAMSUNG.COM Website)

## SAMSUNG'S ANDROID-POWERED TABLET COMPUTERS STANDARD APPLICATIONS INFRINGE

The Samsung Android-Powered Tablet Computers infringe claims of U.S. Patent number 6,826,744 because Android Framework standard applications are installed into these Tablet Computers by Samsung during the manufacturing process (many of which are non-removable). The Tablet Computer is then imported into the United States containing these non-removable applications. These applications are developed using: **"A method for generating a computer application on a host system in an arbitrary object framework that separates a content of said computer application, a form of said computer application and a functionality of said computer application."**

The Samsung Tablet Computers in Figure 2 are Android Powered Tablet Computers. As such, they include the following standard Android apps:

- Email
- Gmail
- Google Maps
- Navigation
- Internet Browser
- Contacts
- Calendar
- Camera
- Market
- Alarm Clock
- Calculator
- Music Player
- You Tube Video Player
- Photo Album

These standard applications, many of which are non-removable, form the heart of the Tablet Computer. Without them, the Tablet Computer will not operate and could not be sold in the U.S.

## **INFRINGEMENT BY THE ANDROID FRAMEWORK**

In order to explain this, and how the Android Framework infringes, the book “Professional Android 2 Application Development”, ISBN 978-0-470-5656552-0 written by Reto Meier will be used. "Reto Meier is a software developer who has been involved in Android since its initial release in 2007. He is an Android Developer Advocate at Google". This book will be referred to as the “Meier Book”.

### **Claim 1:**

**“A method for generating a computer application on a host system in an arbitrary object framework that separates a content of said computer application, a form of said computer application and a functionality of said computer application, said method comprising: “**

**“Creating arbitrary objects with corresponding arbitrary names of various object types”**

**“for generating said content of said computer application, “**

**“said form of said computer application, “**

**“and said functionality of said computer application;”**

**“managing said arbitrary objects in an object library; “**

**“and deploying said arbitrary objects from said object library into a design framework to create said computer application.”**

### **Claim 1 Preamble**

**“A method for generating a computer application on a host system in an arbitrary object framework that separates a content of said computer application, a form of said computer application and a functionality of said computer application, said method comprising: “**

-Android is a framework of arbitrary objects which separates form, function and content of a computer application, which runs on a host, either a smart phone , a tablet PC or even a virtual machine on a PC.

Patent # 6,826,744 Claim Chart for the Android Framework  
Meier Book, Page xvii (more specifically 4<sup>th</sup> paragraph) and Page 4 (more specifically 7<sup>th</sup> bullet) essentially describes what is known in the industry as a framework.

## INTRODUCTION

Now is an exciting time for mobile developers. Mobile phones have never been more popular, and powerful smartphones are now a popular choice for consumers. Stylish and versatile phones packing hardware features like GPS, accelerometers, and touch screens, combined with fixed-rate, reasonably priced data plans provide an enticing platform upon which to create innovative mobile applications.

A host of Android handsets are now available to tempt consumers, including phones with QVGA screens and powerful WVGA devices like the Motorola Droid and the Google Nexus One. The real win though, is for developers. With much existing mobile development built on proprietary operating systems that restrict the development and deployment of third-party applications, Android offers an open alternative. Without artificial barriers, Android developers are free to write applications that take full advantage of increasingly powerful mobile hardware and distribute them in an open market.

As a result, developer interest in Android devices has exploded as handset sales have continued to grow. In 2009 and the early parts of 2010 more than 20 Android handsets have been released from OEMs including HTC, Motorola, LG, Samsung, and Sony Ericsson. Android devices are now available in over 26 countries on more than 32 carriers. In the United States, Android devices are available on all four major carriers: T-Mobile, Verizon, AT&T, and Sprint. Additionally, you can now buy the unlocked Google Nexus One handset directly from Google at <http://www.google.com/phone>.

Built on an open source framework, and featuring powerful SDK libraries and an open philosophy, Android has opened mobile phone development to thousands of developers who haven't had access to tools for building mobile applications. Experienced mobile developers can now expand into the Android platform, leveraging the unique features to enhance existing products or create innovative new ones.

Using the Android Market for distribution, developers can take advantage of an open marketplace, with no review process, for distributing free and paid apps to all compatible Android devices.

This book is a hands-on guide to building mobile applications using version 2 of the Android software development kit. Chapter by chapter, it takes you through a series of sample projects, each introducing new features and techniques to get the most out of Android. It covers all the basic functionality as well as exploring the advanced features through concise and useful examples.

Google's philosophy is to release early and iterate often. Since Android's first full release in October 2008, there have been seven platform and SDK releases. With such a rapid release cycle, there are likely to be regular changes and improvements to the software and development libraries. While the Android engineering team has worked hard to ensure backwards compatibility, future releases are likely to date some of the information provided in this book.

Nonetheless, the explanations and examples included here will give you the grounding and knowledge needed to write compelling mobile applications using the current SDK, along with the flexibility to quickly adapt to future enhancements.

FIGURE 3 (Meier Book, Page XVII)

stack produced and supported by the Open Handset Alliance and designed to operate on any handset that meets the requirements. Google has now released its first direct-to-consumer handset, the Nexus 1, but this device remains simply one hardware implementation running on the Android platform.

## ANDROID: AN OPEN PLATFORM FOR MOBILE DEVELOPMENT

Google's Andy Rubin describes Android as:

*The first truly open and comprehensive platform for mobile devices, all of the software to run a mobile phone but without the proprietary obstacles that have hindered mobile innovation. (<http://googleblog.blogspot.com/2007/11/wheres-my-gphone.html>)*

Put simply, Android is a combination of three components:

- A free, open-source operating system for mobile devices
- An open-source development platform for creating mobile applications
- Devices, particularly mobile phones, that run the Android operating system and the applications created for it

More specifically, Android is made up of several necessary and dependent parts, including the following:

- A hardware reference design that describes the capabilities required for a mobile device to support the software stack.
- A Linux operating system kernel that provides low-level interface with the hardware, memory management, and process control, all optimized for mobile devices.
- Open-source libraries for application development, including SQLite, WebKit, OpenGL, and a media manager.
- A run time used to execute and host Android applications, including the Dalvik virtual machine and the core libraries that provide Android-specific functionality. The run time is designed to be small and efficient for use on mobile devices.
- An application framework that agnostically exposes system services to the application layer, including the window manager and location manager, content providers, telephony, and sensors.
- A user interface framework used to host and launch applications.
- Preinstalled applications shipped as part of the stack.
- A software development kit used to create applications, including tools, plug-ins, and documentation.

What really makes Android compelling is its open philosophy, which ensures that you can fix any deficiencies in user interface or native application design by writing an extension or replacement. Android

FIGURE 4 (Meier Book, Page 4)

Meier Book, Page 28 explains how the UI (Form) "decouples" the application logic (function) from your UI design (form) on its first paragraph.

Listing 2-2 shows the UI layout defined in the `main.xml` file created by the Android project template.



#### LISTING 2-2: Hello World layout resource

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```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">
    <TextView
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Hello World, HelloWorld"
    />
</LinearLayout>
```

Defining your UI in XML and inflating it is the preferred way of implementing your user interfaces, as it neatly decouples your application logic from your UI design.

To get access to your UI elements in code, you add identifier attributes to them in the XML definition. You can then use the `findViewById` method to return a reference to each named item. The following XML snippet shows an ID attribute added to the Text View widget in the Hello World template:

```
<TextView
    android:id="@+id/myTextView"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Hello World, HelloWorld"
/>
```

And the following snippet shows how to get access to it in code:

```
TextView myTextView = (TextView)findViewById(R.id.myTextView);
```

Alternatively (although it's not generally considered good practice), you can create your layout directly in code, as shown in Listing 2-3.



#### LISTING 2-3: Creating layouts in code

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```
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    LinearLayout.LayoutParams lp;
    lp = new LinearLayout.LayoutParams(LinearLayout.LayoutParams.FILL_PARENT,
        LinearLayout.LayoutParams.FILL_PARENT);

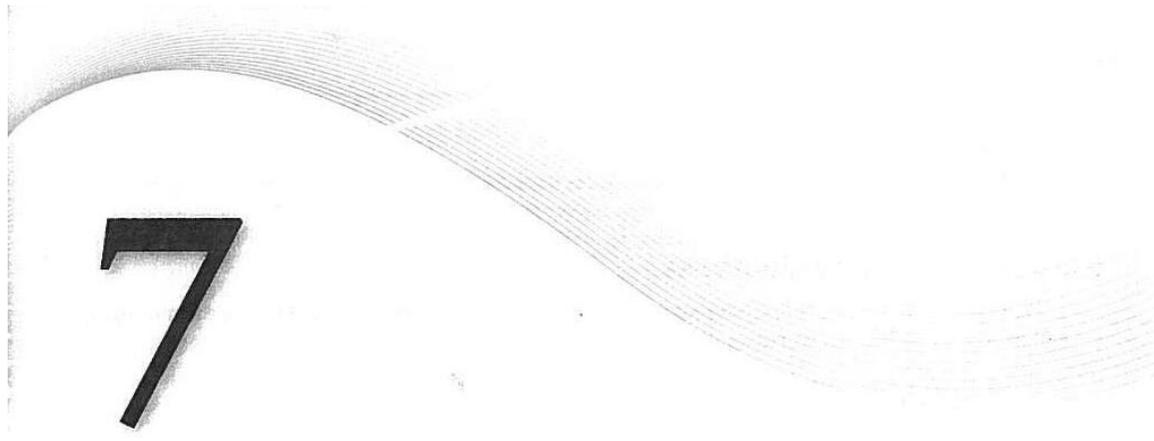
    LinearLayout.LayoutParams textViewLP;
    textViewLP = new LinearLayout.LayoutParams(LinearLayout.LayoutParams.FILL_PARENT,
        LinearLayout.LayoutParams.WRAP_CONTENT);

    LinearLayout ll = new LinearLayout(this);
    ll.setOrientation(LinearLayout.VERTICAL);

    TextView myTextView = new TextView(this);
    myTextView.setText("Hello World, HelloWorld");
```

FIGURE 5 (Meier Book, Page 28)

Meier Book, Page 209 defines how the "Content Providers" "decouples" data storage (content) from your application logic (function) on its third paragraph.



## Databases and Content Providers

### WHAT'S IN THIS CHAPTER?

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- Creating databases and using SQLite
- Using Content Providers to share application data
- Querying Content Providers
- Using Cursors and Content Values to read and write from and to Content Providers
- Database design considerations
- Introduction to the native Content Providers
- Using the Contact Content Provider

In this chapter you'll be introduced to the SQLite library, and you'll look at how to use Content Providers to share and use structured data within and between applications.

SQLite offers a powerful SQL database library that provides a robust persistence layer over which you have total control.

Content Providers offer a generic interface to any data source by decoupling the data storage layer from the application layer.

By default, access to a database is restricted to the application that created it. Content Providers offer a standard interface your applications can use to share data with and consume data from other applications — including many of the native data stores.

### INTRODUCING ANDROID DATABASES

Structured data persistence in Android is provided through the following mechanisms:

- **SQLite Databases** When managed, structured data is the best approach, Android offers the SQLite relational database library. Every application can create its own databases over which it has complete control.

FIGURE 6 (Meier Book, Page 209)

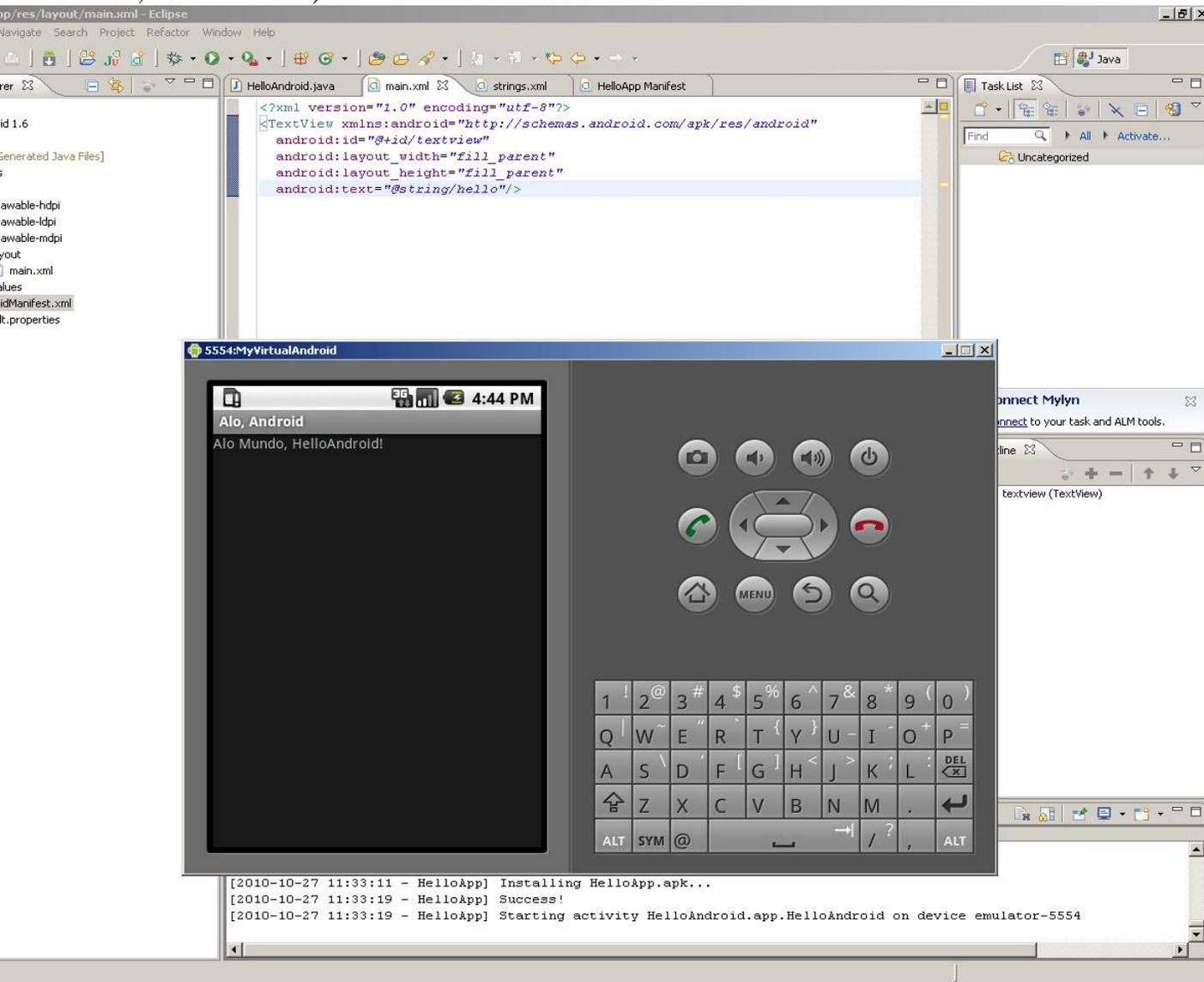
## Patent # 6,826,744 Claim Chart for the Android Framework

Android's objects can be arbitrary objects. We created a sample application using the Android Software Developers' Kit (Android SDK). In the following example:

```
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/textview"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:text="@string/hello"/>
```

The Arbitrary Object “textview” is being called by its name (android:id="@+id/textview"), and additionally has three parameters.

When compiling and running the application, the compilation goes fine, and the application runs fine (it prints “Alo mundo,Hello Android!”) on the Android device as seen in here”



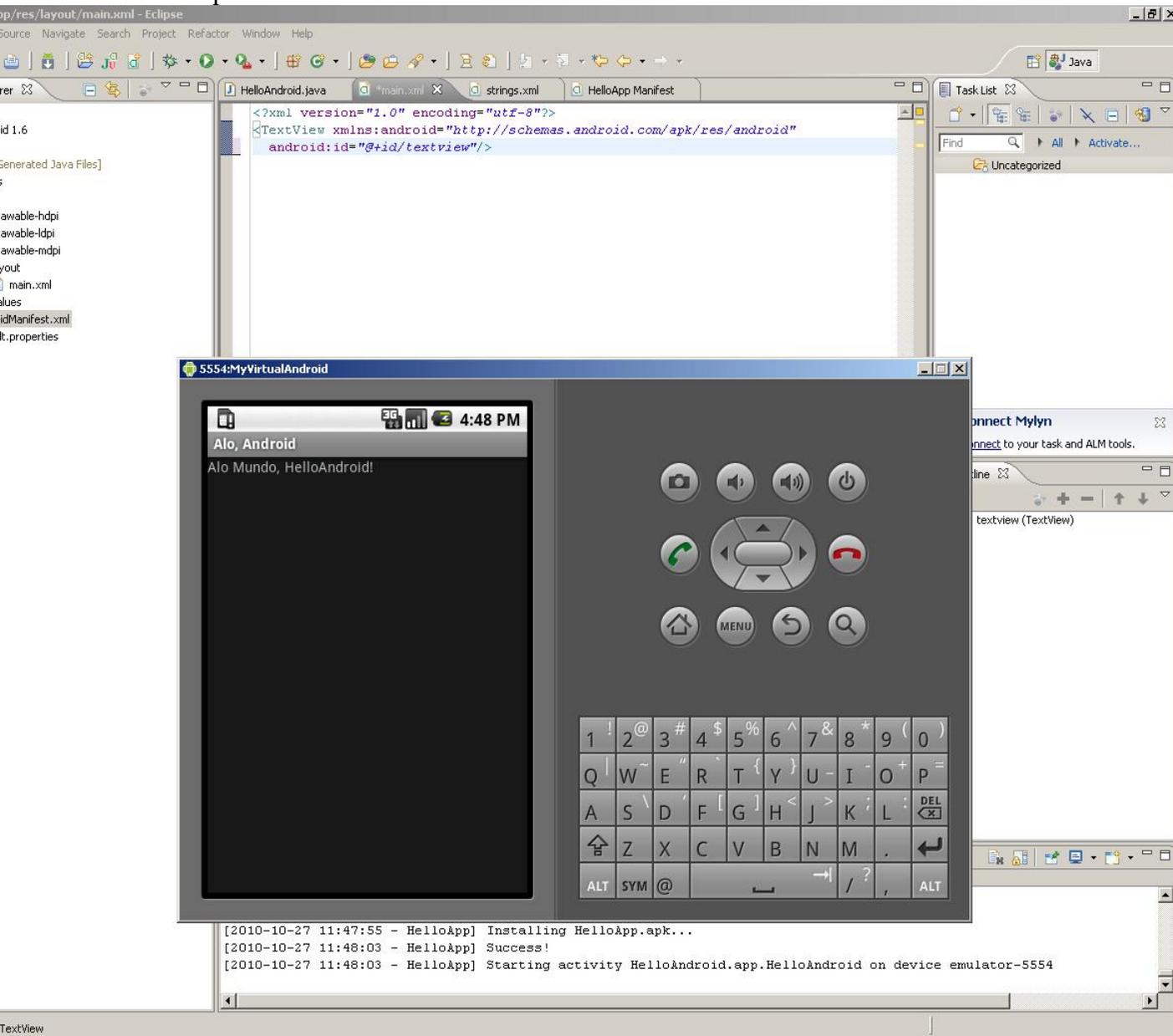
**FIGURE 7 (Arbitrary Objects called with parameters)**

## Patent # 6,826,744 Claim Chart for the Android Framework

However, when we modify the call to “textview” to include just the name of the Arbitrary Object, the call will look this way:

```
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/textview"
/>
```

When making the above modification, the program compiles fine and the application runs normally, as can be seen on this screen print:



**FIGURE 8 (Arbitrary Objects called by name only)**

## **Claim 1 Element 1**

### **“Creating arbitrary objects with corresponding arbitrary names of various object types”**

The creation of those Arbitrary objects can be using command line tools, such as a text editor, or using the recommended tool , which is named Eclipse. Using a text editor is a lot more work because all of the files needed to create the object need to be edited correctly and placed on the correct location (folders), in order for the compiler to work. Using Eclipse facilitates the process but it is not necessary to create the Arbitrary Objects.

The steps for generating a Computer application on the Android Framework when not using Eclipse are:

- Creation of the application either by manually creating each source file with a text editor
- Compiling of the application using a Java Compiler
- Creating a “package” (A file which’s extension is .APK”, using the Android SDK named apkbuilder.bat , which is distributed with the Android SDK.
- Moving that package file to the Android device, either by using Google’s “Android Market” application (in the case of a SmartPhone), or using the built in android application named “File Manager”, clicking on the file, and Android will then install it on the device.

When using eclipse, all is necessary is to click on the “Run” menu – that is what was done on the application described earlier.

## Claim 1 Element 2

“for generating said content of said computer application, “

The content can be generated by the “Content Provider” feature of Android. Meier Book, Pages 209-211 is a description of how it works. The title of the chapter, and throughout the whole text, it clarifies that the Android Framework can be used for generating the content:

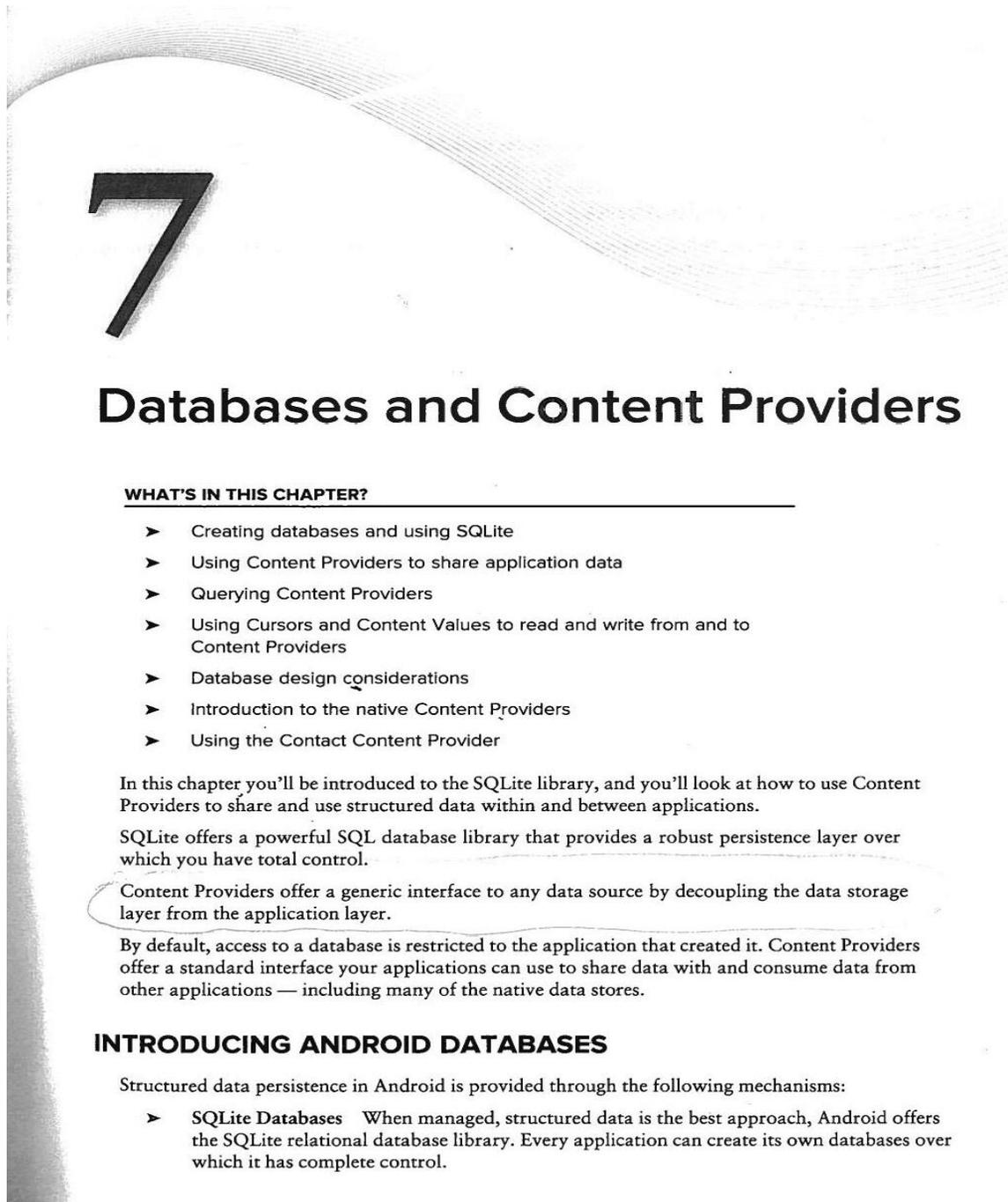


FIGURE 9 (Meier Book, Page 209)

- ▶ **Content Providers** Content Providers offer a generic, well-defined interface for using and sharing data.

## Introducing SQLite Databases

Using SQLite you can create independent relational databases for your applications. Use them to store and manage complex, structured application data.

Android databases are stored in the `/data/data/<package_name>/databases` folder on your device (or emulator). By default all databases are private, accessible only by the application that created them.

Database design is a big topic that deserves more thorough coverage than is possible within this book. It is worth highlighting that standard database best practices still apply in Android. In particular, when you're creating databases for resource-constrained devices (such as mobile phones), it's important to normalize your data to reduce redundancy.

## Introducing Content Providers

Content Providers provide an interface for publishing and consuming data, based around a simple URI addressing model using the `content://` schema. They let you decouple the application layer from the data layer, making your applications data-source agnostic by hiding the underlying data source.

Shared Content Providers can be queried for results, existing records updated or deleted, and new records added. Any application with the appropriate permissions can add, remove, or update data from any other application — including from the native Android databases.

Many native databases are available as Content Providers, accessible by third-party applications, including the phone's contact manager, media store, and other native databases as described later in this chapter.

By publishing your own data sources as Content Providers, you make it possible for you (and other developers) to incorporate and extend your data in new applications.

## INTRODUCING SQLite

*SQLite* is a well regarded relational database management system (RDBMS). It is:

- ▶ Open-source
- ▶ Standards-compliant
- ▶ Lightweight
- ▶ Single-tier

It has been implemented as a compact C library that's included as part of the Android software stack.

By being implemented as a library, rather than running as a separate ongoing process, each SQLite database is an integrated part of the application that created it. This reduces external dependencies, minimizes latency, and simplifies transaction locking and synchronization.

SQLite has a reputation for being extremely reliable and is the database system of choice for many consumer electronic devices, including several MP3 players, the iPhone, and the iPod Touch.

FIGURE 10 (Meier Book, Page 210)

Lightweight and powerful, SQLite differs from many conventional database engines by loosely typing each column, meaning that column values are not required to conform to a single type. Instead, each value is typed individually for each row. As a result, type checking isn't necessary when assigning or extracting values from each column within a row.

For more comprehensive coverage of SQLite, including its particular strengths and limitations, check out the official site at <http://www.sqlite.org/>

## CURSORS AND CONTENT VALUES

ContentValues are used to insert new rows into tables. Each ContentValues object represents a single table row as a map of column names to values.

Queries in Android are returned as Cursor objects. Rather than extracting and returning a copy of the result values, Cursors are pointers to the result set within the underlying data. Cursors provide a managed way of controlling your position (row) in the result set of a database query.

The Cursor class includes a number of navigation functions including, but not limited to, the following:

- `moveToFirst` Moves the cursor to the first row in the query result
- `moveToNext` Moves the cursor to the next row
- `moveToPrevious` Moves the cursor to the previous row
- `getCount` Returns the number of rows in the result set
- `getColumnIndexOrThrow` Returns the index for the column with the specified name (throwing an exception if no column exists with that name)
- `getColumnName` Returns the name of the specified column index
- `getColumnNames` Returns a string array of all the column names in the current Cursor
- `moveToPosition` Moves the Cursor to the specified row
- `getPosition` Returns the current Cursor position

Android provides a convenient mechanism for simplifying the management of Cursors within your Activities. The `startManagingCursor` method integrates the Cursor's lifetime into the calling Activity's. When you've finished with the Cursor, call `stopManagingCursor` to do just that.

Later in this chapter you'll learn how to query a database and how to extract specific row/column values from the resulting Cursors.

## WORKING WITH SQLite DATABASES

It's good practice to create a helper class to simplify your database interactions.

The following section shows you how to create a database adapter class for your database. This abstraction layer encapsulates your database interactions. It will provide intuitive, strongly typed methods for adding, removing, and updating items. A database adapter should also handle queries and expose methods for creating, opening, and closing the database.

FIGURE 11 (Meier Book, Page 211)

## Claim 1 Element 3

“said form of said computer application, “

Form in the Android Framework normally is defined on the Resource folder, referred to as “R” or “Layouts”, having the default “layout.xml” as the Form, but this name can be changed. On Meier Book, Page 63 and 64 describes how they work. More specifically, the last three paragraphs of Page 63 define Layouts as your “Presentation Layer” and “User Interface”, which is Form.

Externalizing Resources | 63

```
<item name="attributeName">value</item>
</style>
</resources>
```

Styles support inheritance using the parent attribute on the <style> tag, making it easy to create simple variations.

The following example shows two styles that can also be used as a theme: a base style that sets several text properties and a second style that modifies the first to specify a smaller font.

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <style name="BaseText">
    <item name="android:textSize">14sp</item>
    <item name="android:textColor">#111</item>
  </style>
  <style name="SmallText" parent="BaseText">
    <item name="android:textSize">8sp</item>
  </style>
</resources>
```

### Drawables

Drawable resources include bitmaps and NinePatch (stretchable PNG) images. They also include complex composite Drawables, such as `LevelListDrawables` and `StateListDrawables` that can be defined in XML.

Both NinePatch Drawables and complex composite resources are covered in more detail in the next chapter.

All Drawables are stored as individual files in the `res/drawable` folder. The resource identifier for a Drawable resource is the lowercase file name without an extension.



*The preferred format for a bitmap resource is PNG, although JPG and GIF files are also supported.*

### Layouts

Layout resources let you decouple your presentation layer by designing user interface layouts in XML rather than constructing them in code.

The most common use of a layout is for defining the user interface for an Activity. Once defined in XML, the layout is “inflated” within an Activity using `setContentView`, usually within the `onCreate` method. You can also reference layouts from within other layout resources, such as layouts for each row in a List View. More detailed information on using and creating layouts in Activities can be found in Chapter 4.

Using layouts to create your screens is best-practice UI design in Android. The decoupling of the layout from the code lets you create optimized layouts for different hardware configurations, such as varying screen sizes, orientation, or the presence of keyboards and touchscreens.

FIGURE 12 (Meier Book, Page 63)

Each layout definition is stored in a separate file, each containing a single layout, in the `res/layout` folder. The file name then becomes the resource identifier.

A thorough explanation of layout containers and View elements is included in the next chapter, but as an example Listing 3-2 shows the layout created by the New Project Wizard. It uses a Linear Layout (described in more detail in Chapter 4) as a layout container for a Text View that displays the “Hello World” greeting.



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### LISTING 3-2: Hello World layout

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">
    <TextView
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Hello World!"
    />
</LinearLayout>
```

## Animations

Android supports two types of animation. *Tweened animations* can be used to rotate, move, stretch, and fade a View; or you can create frame-by-frame animations to display a sequence of Drawable images. A comprehensive overview of creating, using, and applying animations can be found in Chapter 15.

Defining animations as external resources enables you to reuse the same sequence in multiple places and provides you with the opportunity to present different animations based on device hardware or orientation.

### Tweened Animations

Each tweened animation is stored in a separate XML file in the project’s `res/anim` folder. As with layouts and Drawable resources, the animation’s file name is used as its resource identifier.

An animation can be defined for changes in alpha (fading), scale (scaling), translate (movement), or rotate (rotation).

Table 3-1 shows the valid attributes, and attribute values, supported by each animation type.

You can create a combination of animations using the `set` tag. An animation set contains one or more animation transformations and supports various additional tags and attributes to customize when and how each animation within the set is run.

The following list shows some of the set tags available.

- `duration` Duration of the animation in milliseconds.
- `startOffset` Millisecond delay before the animation starts.

FIGURE 13 (Meier Book, Page 64)

Mobile devices come in a large variety of shapes and sizes and are used across the world. In this chapter you'll learn how to externalize resources to ensure your applications run seamlessly on different hardware (particularly different screen resolutions and pixel densities), in different countries, and supporting multiple languages.

Next you'll examine the Application class, and learn how to extend it to provide a place for storing application state values.

Arguably the most important of the Android building blocks, the Activity class forms the basis for all your user interface screens. You'll learn how to create new Activities and gain an understanding of their life cycles and how they affect the application lifetime.

Finally, you'll be introduced to some of the Activity subclasses that simplify resource management for some common user interface components such as maps and lists.

## WHAT MAKES AN ANDROID APPLICATION?

Android applications consist of loosely coupled components, bound by an application manifest that describes each component and how they all interact, as well as the application metadata including its hardware and platform requirements.

The following six components provide the building blocks for your applications:

- **Activities** Your application's presentation layer. Every screen in your application will be an extension of the Activity class. Activities use Views to form graphical user interfaces that display information and respond to user actions. In terms of desktop development, an Activity is equivalent to a Form. You'll learn more about Activities later in this chapter.
- **Services** The invisible workers of your application. Service components run in the background, updating your data sources and visible Activities and triggering Notifications. They're used to perform regular processing that needs to continue even when your application's Activities aren't active or visible. You'll learn how to create Services in Chapter 9.
- **Content Providers** Shareable data stores. Content Providers are used to manage and share application databases. They're the preferred means of sharing data across application boundaries. This means that you can configure your own Content Providers to permit access from other applications and use Content Providers exposed by others to access their stored data. Android devices include several native Content Providers that expose useful databases like the media store and contact details. You'll learn how to create and use Content Providers in Chapter 7.
- **Intents** An inter-application message-passing framework. Using Intents you can broadcast messages system-wide or to a target Activity or Service, stating your intention to have an action performed. The system will then determine the target(s) that will perform any actions as appropriate.
- **Broadcast Receivers** Intent broadcast consumers. If you create and register a Broadcast Receiver, your application can listen for broadcast Intents that match specific filter

FIGURE 14 (Meier Book, Page 50)

## Claim 1 Element 4

“and said functionality of said computer application;”

Meier Book, Page 50 , second bullet, describes “Services” as “The invisible workers of the application”, (Which can be Functionality).

Mobile devices come in a large variety of shapes and sizes and are used across the world. In this chapter you'll learn how to externalize resources to ensure your applications run seamlessly on different hardware (particularly different screen resolutions and pixel densities), in different countries, and supporting multiple languages.

Next you'll examine the `Application` class, and learn how to extend it to provide a place for storing application state values.

Arguably the most important of the Android building blocks, the `Activity` class forms the basis for all your user interface screens. You'll learn how to create new `Activities` and gain an understanding of their life cycles and how they affect the application lifetime.

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### WHAT MAKES AN ANDROID APPLICATION?

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The following six components provide the building blocks for your applications:

- ▶ **Activities** Your application's presentation layer. Every screen in your application will be an extension of the `Activity` class. `Activities` use `Views` to form graphical user interfaces that display information and respond to user actions. In terms of desktop development, an `Activity` is equivalent to a `Form`. You'll learn more about `Activities` later in this chapter.
- ▶ **Services** The invisible workers of your application. `Service` components run in the background, updating your data sources and visible `Activities` and triggering `Notifications`. They're used to perform regular processing that needs to continue even when your application's `Activities` aren't active or visible. You'll learn how to create `Services` in Chapter 9.
- ▶ **Content Providers** Shareable data stores. `Content Providers` are used to manage and share application databases. They're the preferred means of sharing data across application boundaries. This means that you can configure your own `Content Providers` to permit access from other applications and use `Content Providers` exposed by others to access their stored data. Android devices include several native `Content Providers` that expose useful databases like the media store and contact details. You'll learn how to create and use `Content Providers` in Chapter 7.
- ▶ **Intents** An inter-application message-passing framework. Using `Intents` you can broadcast messages system-wide or to a target `Activity` or `Service`, stating your intention to have an action performed. The system will then determine the target(s) that will perform any actions as appropriate.
- ▶ **Broadcast Receivers** `Intent` broadcast consumers. If you create and register a `Broadcast Receiver`, your application can listen for broadcast `Intents` that match specific filter

FIGURE 15 (Meier Book, Page 50)

## **Claim 1 Element 5**

**“managing said arbitrary objects in an object library; “**

The object library, when using eclipse is described as the “Workspace” of the Android Applications. If not using Eclipse, the management of these objects can be done manually by using normal command-line commands , such as “Copy”, “Rename” , “Delete” or “Move”, inside of a folder structure which is mandated by the Android SDK so the Computer Application can be built properly.

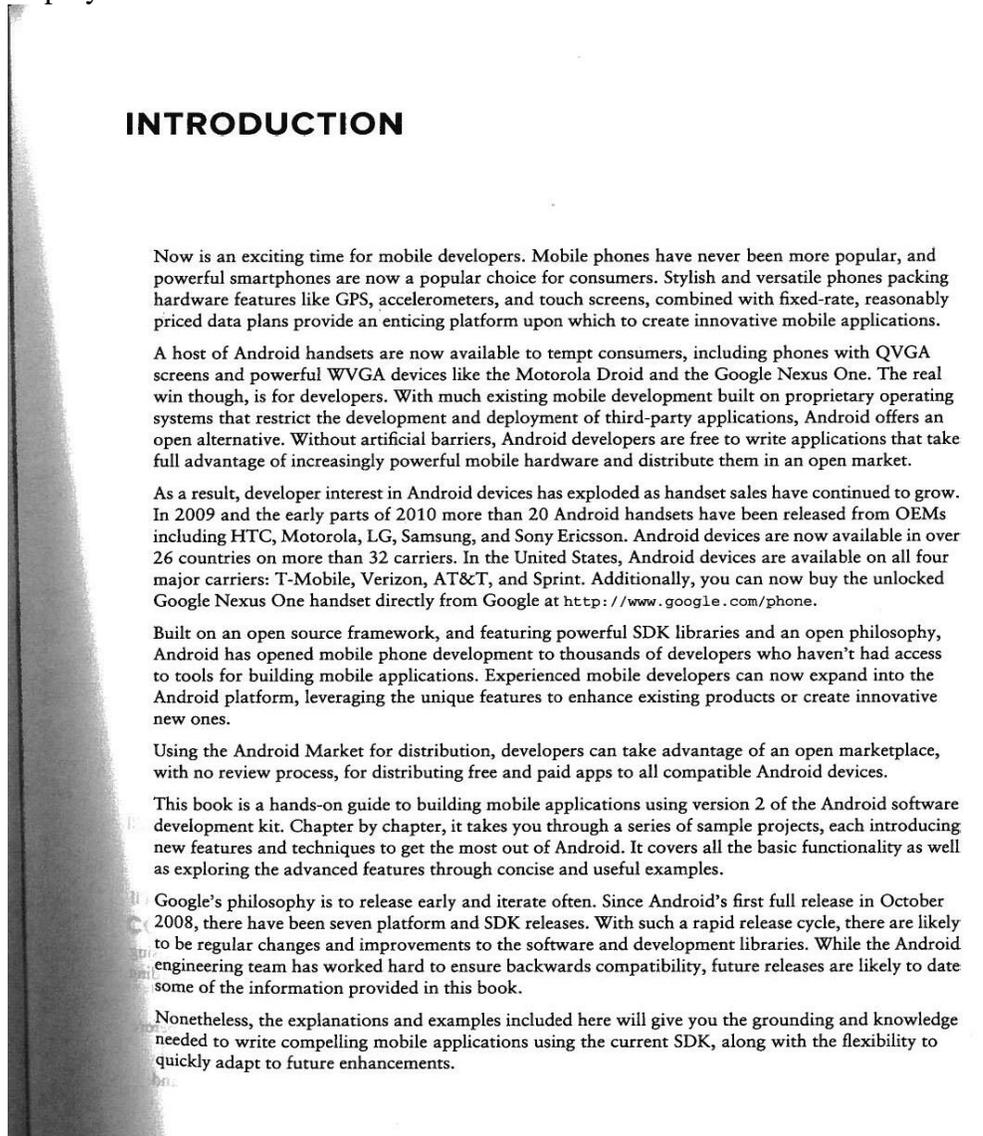
## Claim 1 Element 6

**“and deploying said arbitrary objects from said object library into a design framework to create said computer application.”**

These Arbitrary objects are deployed by building the complete application as described earlier :

-Moving that package file to the Android device, either by using Google’s “Android Market” application (in the case of a SmartPhone), or using the built-in android application named “File Manager”, clicking on the file, and Android will then install it on the device.

The Meier Book, page XVII, on its 5<sup>th</sup> Paragraph, describes that the Android Market can be used for distribution, or Deployment:



**FIGURE 16 (Meier Book, Page XVII)**

### **Claim 3:**

**“The method of claim 1, wherein said various object types comprise text file pointers.”**

The Computer Application demonstrated on Claim 1, Element 1, makes use of text file pointers.

### **Claim 4:**

**“The method of claim 1, wherein said various object types comprise binary file pointers.”**

The Computer Application demonstrated on Claim 1, Element 1, makes use of binary file pointers.

### **Claim 5:**

**“The method of claim 1, wherein said various object types comprise compiled executables.”**

The Computer Application demonstrated on Claim 1, Element 1, compiles into an executable.

## Claim 9:

“The method of claim 1, wherein said various object types comprise cached executables.”

The Computer Application demonstrated on Claim 1, Element 1, compiles into an executable, which can be cached by the Android Framework. Like any operating system, every object that the frame work hosts will be cached: In this picture showing the Android terminal emulation application, the response to the command “ls” shows a subdirectory named “cache”:

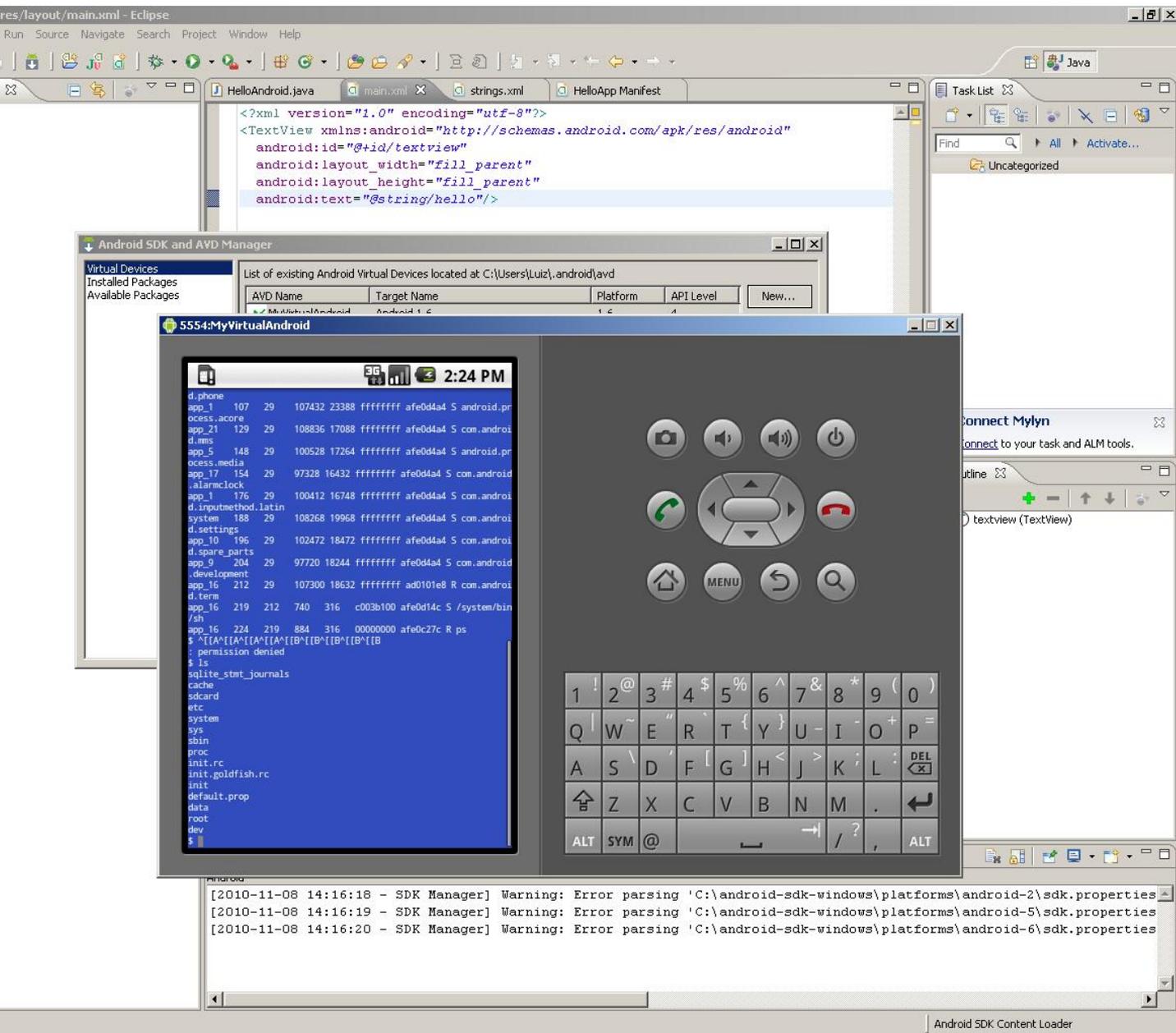


FIGURE 17 (use cache)

## **Claim 17:**

**“The method of claim 1, further comprising deploying arbitrary objects locally.”**

The Computer Application demonstrated on Claim 1, Element 1, makes use of arbitrary objects locally.

## **Claim 21:**

**“The method of claim 1, wherein said arbitrary objects can be accessed and deployed into said design framework using said corresponding arbitrary names.”**

The Android Framework enables access and deployment of said arbitrary names into said design framework.

## Claim 23:

“The method of claim 1, further comprising caching objects.”

The Android Framework caches objects. In this picture showing the Android terminal emulation application, the response to the command “ls” shows a subdirectory named “cache”:

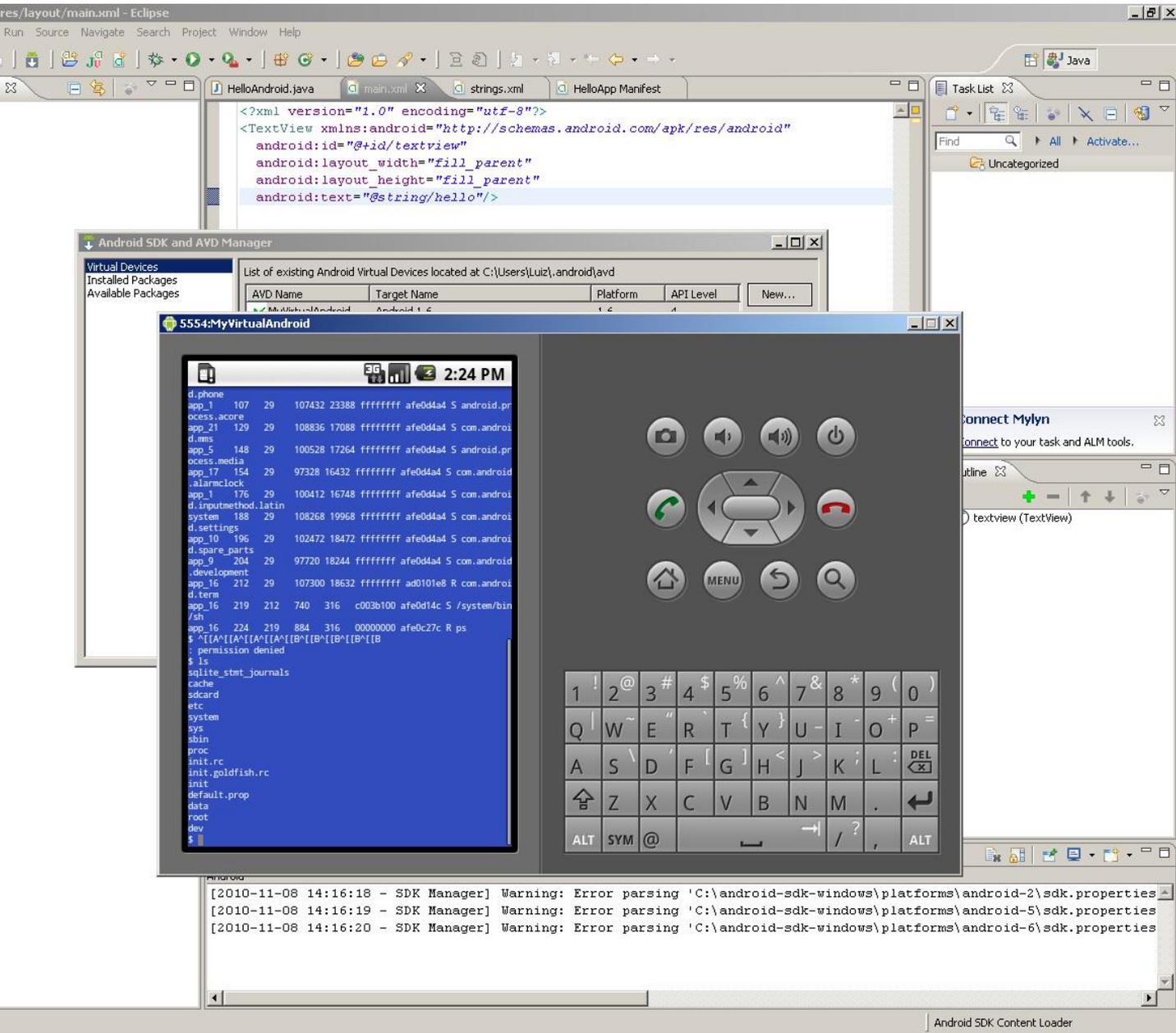


FIGURE 17 (use cache)

## **Claim 25:**

**“The method of claim 1, further comprising generating arbitrary objects in a programming language that is compatible or supported by said host system.”**

The Android Framework allows such arbitrary objects to be developed in Java, which is a programming language supported by the host system.