

# Making Your Mark on Documents with Custom Acrobat® Annotations

## Introduction

Annotations are items of information associated with a page in a PDF document, but they are separate from the page's contents. Annotations are typically added with a tool, such as the Pencil tool in Acrobat 4.0 that allows you to draw marks on a page. Acrobat 4.0 provides diverse types of annotations that allow you to add text notes, mark-up the document, add sounds and movies, and embed files in a PDF document.

These prosaic statements don't convey the usefulness, flexibility, and power of annotations. If Acrobat's built-in annotations don't give you the capabilities you want, *you can define your own annotations having the characteristics you desire.*

## Create Your Own Annotation Type with a Plug-in

Inside a PDF file, an annotation is simply a set of key-value pairs known as a *dictionary*. Only a few keys, such as the annotation type, are required in an annotation dictionary. A custom annotation can contain any other keys and values you want. Dictionaries are very flexible data structures: essentially any object in a PDF file can serve as the value of a key. Thus an annotation can store just about any data.

Acrobat does a lot of the work of handling annotations for you. It automatically displays and prints annotations. You can easily add and delete annotations through the Acrobat user interface.

You can create custom annotations with an Acrobat plug-in. The Acrobat plug-in API deals with annotations through an *annotation handler*, which is a set of functions that are automatically called by Acrobat to handle annotations. The functions in the annotation handler get called in response to user actions, such as mouse movement or mouse clicks. Annotation handlers handle all annotations, whether built-in or custom. Acrobat allows you to define custom annotation types by creating your own annotation handler in a plug-in.

## Annotations are Flexible and Dynamic

Since they are dictionaries, annotations are inherently extensible. The Acrobat plug-in API makes it easy to add and remove information from annotations.

Other characteristics of annotations can also be altered. For instance, annotations are typically visible when viewing a page, but they don't have to be. Annotations don't have to

print with the rest of the document's contents either: whether an annotation prints is independent of whether it's visible or not. An invisible annotation could be printable, which would allow the printed appearance of a page to be different than its appearance in an Acrobat viewer. For instance, an annotation stamp could print on a page, even when this was not visible while viewing the page in Acrobat. The stamp could contain extra information, or could prevent the printed document from being useful to an unauthorized party.

You can allow extensive user interaction with annotations. For instance, the Acrobat Forms plug-in uses annotations for form fields, allowing users to fill in values in the fields. You could give users the ability to change your annotations in other ways, such as changing their colors.

## Choose Your Annotation's Appearance

An annotation's appearance can be stored in its PDF file. This means that users don't need your plug-in to see or print custom annotations.

*An annotation can appear any way you wish.* Inside a PDF file, an annotation's appearance is represented by an *XObject Form*, which is an object describing any text, graphics, or sampled images that may be drawn on a page. For example, you can make an annotation look like all or part of a page in a PDF file.

An annotation's appearance is not static; it may have a variety of appearances that you choose according to circumstance. In addition, you can programmatically create the appearance of an annotation. With the PDFEdit part of the Acrobat plug-in API (available in Acrobat 4.0), you can author the appearance of annotations and even pages in a PDF file. PDFEdit treats the appearance of an annotation as a list of objects, such as text and graphics. You can create objects and set their attributes to build the appearance you want. For example, you can create text with a specified font, point size, and color.

## Managing Annotations in Acrobat 4.0

Acrobat 4.0's user interface adds an *annotations pane*, which lists annotations in the document. In this pane, you can sort annotations by type, author, page number, or date. You can also display custom annotations in this pane by adding a few functions to your annotation handler.

Similarly to the capabilities provided for Acrobat Form fields, Acrobat 4.0 allows exporting annotations to a *Forms Data Format* (FDF) file. This FDF file completely specifies the annotations, including their appearance. You can import this file into another document to copy annotations from the original document.

## Form Field Annotations

The Acrobat Forms plug-in demonstrates how sophisticated annotations can be. The Forms plug-in provides a user interface to create and configure form fields. All the attributes of a form field can be set through a dialog box with tabs and fields of its own.

You can change a form field by setting the value you want to associate with the field. How the field's value is set depends on the type of the field; you type a value into a text field, you click on a check box, and so on. You can even make a field perform actions driven by a JavaScript program, so quite intricate interactions are possible.

These capabilities are provided by the Form fields annotation handler in the Forms plug-in. Many such plug-ins are possible! Ultimately, a plug-in is a program itself. This opens the possibility of repurposing existing code to work in a custom annotation handler.

## Annotations as Databases

We can think of a set of annotations as a *database*, since an annotation is simply a set of key-value pairs. Each individual annotation is a record in the database of annotations of that type. Given a record—an annotation—you can retrieve the value of any valid key. With this paradigm, you can use annotations in new ways. If annotations are treated as a database, it's possible to integrate with other database handling software. For instance, you could search for annotations whose keys met specified criteria. A parser could be written to produce an annotation handler for an annotation based on a database schema.

## Summary

Annotations provide a straightforward way to add information and value to PDF documents. A custom annotation can have just about any data, appearance, and behavior you wish. Acrobat has built-in facilities for creating custom annotations. The Acrobat Forms plug-in shows how much can be done with a custom annotation.

## Further Reading

For information on the structure of annotations, see the *Portable Document Format Reference Manual, Version 1.3*, Section 6.6, "Annotations." The *Acrobat Core API Overview*, Adobe Technical Note #5190, has a section describing annotation handlers in its *Handlers* chapter. For detailed programming information, see the description and attendant links of the *AVAppRegisterAnnotHandler* API function in the definitive description of the plug-in API, the *Acrobat Core API Reference*, Adobe Technical Note #5191. All these documents are included in the Acrobat Software Development Kit (SDK), freely available from the Adobe Web site.