Corel Corporation
CorelDRAW and Usability

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Abstract

This report is an exercise of applying knowledge learned at school in a practical way. It will examine CorelDRAW from a usability perspective, incorporating some of the projects I have been involved in over my two work terms at Corel.

After a brief introduction to CorelDRAW, concepts related to goal composition and first principles of user interface design will be explored. Various features of CorelDRAW will be examined to see how it uses these concepts, and how it might improve.

The report will conclude with some general observations and a summary of what was learned over the work term.

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CorelDRAW and Usability

Introduction

I have had the pleasure to work at Corel again for my fourth work term during the spring of 2006. During this time, I worked on the CorelDRAW Graphics Suite X3 release for Asian and Middle Eastern languages as well as some preliminary activities for the next version of CorelDRAW Graphics Suite.

In the semester before this work term, I took a class called User Interface Architecture. As a result, I have been more interested in the processes involved with researching and designing user interfaces. At the beginning of the term, I gave my team a presentation about User and Task Analysis, the stage during which one strives to understand the users of the product being created, and determine how these users work. To continue along these lines, I will be basing this work term report on an analysis of CorelDRAW using information learned in the aforementioned class.

I will incorporate several specific areas that I worked on over my last two terms here at Corel in the analysis, and indicate them as such. However, I will also be including many features of CorelDRAW that I was not directly involved in.

After an introduction to CorelDRAW itself, I will take two broad perspectives for looking at the usability of software and examine CorelDRAW. First, the concept of goal composition will be introduced and several mechanisms of the concept will be explored. Second, a selection of user interface first principles will be used to take a different look at the software. Finally, conclusions about the work term in general will be drawn.

A Quick Introduction to the CorelDRAW Graphics Suite

"Corel Corporation provides easy-to-use personal productivity software that helps millions of users worldwide run their businesses and extend their creativity at work and at home." Corel Corporation's product line includes WordPerfect, CorelDRAW Graphics Suite, Painter, and the Paint Shop family. Since focussing its energy on these core products, Corel Corporation has enjoyed healthy growth and profit[1].

CorelDRAW is the central program to the CorelDRAW Graphics Suite. CorelDRAW is a vector editing program, so it is "better for design and layout, typography, logos, and technical illustrations, while bitmap editors are more suitable for retouching, photo processing, and artistic illustrations."[2] Note that Corel PHOTO-PAINT, a bitmap editor, also comes with the CorelDRAW Graphics Suite.

Vector graphics differ from bitmaps in that vectors are defined mathematically, while bitmaps are a collection of coloured dots (pixels). Vector images, once drawn, can be resized to any scale and retain the exact same quality of the original. Because vector objects are created mathematically, any mathematical transformations can be performed on them. Some basic examples of vector objects that CorelDRAW allows you to draw are rectangles, ellipses, lines, curves, and so on. CorelDRAW also facilitates the creation and formatting of simple or complex text objects.

In addition to these vector objects, CorelDRAW also allows the integration of bitmaps into the document. Users can create and edit the bitmap completely in Corel PHOTO-PAINT or another bitmap editor, or they can use some of the basic editing features that have been integrated into CorelDRAW.

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[1]Corel Corporation Web Site > About

[2]Vector graphics editors - Wikipedia, the free encyclopedia

CorelDRAW and Goal Composition

The success of a computer system is, of course, largely based on allowing users to perform those tasks which are most important to their work. After all, this is a part of one definition of usability, along with "that quality of a system that makes it easy to learn [and] easy to use"[3].

But in addition to facilitating those tasks that the designers already know the users must do, the software needs to include features that anticipate what users will want to do in the future. This is where goal composition[4] comes in. After listing the basic needs of users, each of them are extended and combined with general meta-goals, called goal composition mechanisms.

This section will outline mechanisms that fall under three categories – generalization, integration, and user control – and examine how CorelDRAW has used these concepts to anticipate its users' needs.

Generalization Mechanisms

The three generalization mechanisms of multiplexing, reuse, and supergoaling allow a feature to be applied in more situations than it was originally designed for.

Multiplexing

A multiplexing feature will allow a user to quickly perform multiple instances of a single goal. For example, the find and replace feature
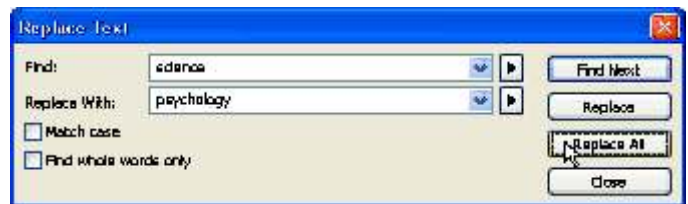

Figure 1 The find and replace dialog in CorelDRAW.

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[3]Definition for usability from 'Data Warehouse: Glossary'

[4]Goal composition concepts are from 'Goal Composition: Extending Task Analysis to Predict Things People *May* Want to Do'

in CorelDRAW, similar to most word processors, allows a user to replace all instances of a particular word with one click instead of replacing each word individually. Furthermore, this feature also facilitates changing the fill and outline properties of objects all at once.

Reuse

"Reuse enables the user to utilize part of the work towards one goal when wanting to achieve a similar goal."[5] Consider the font matching feature I worked on for the release of CorelDRAW X3. Users want to be able to open files such that they always look the same. However, if fonts used for text in the file do not exist on the system anymore, CorelDRAW needs to find alternatives. Reasonable substitutes are suggested by the font matching system, but the user can experiment until he finds the best match for his needs. Instead of repeating this experimentation every time a particular font is needed, the user can instead save the preferred match as an exception, and have the saved font suggested first from there on in.

Supergoaling

Many goals are really just a series of smaller tasks that lead to the final result. Using these sub-tasks in a variety of contexts to achieve a higher goal is called supergoaling. For a good example of this, imagine creating a document that you will export to PDF
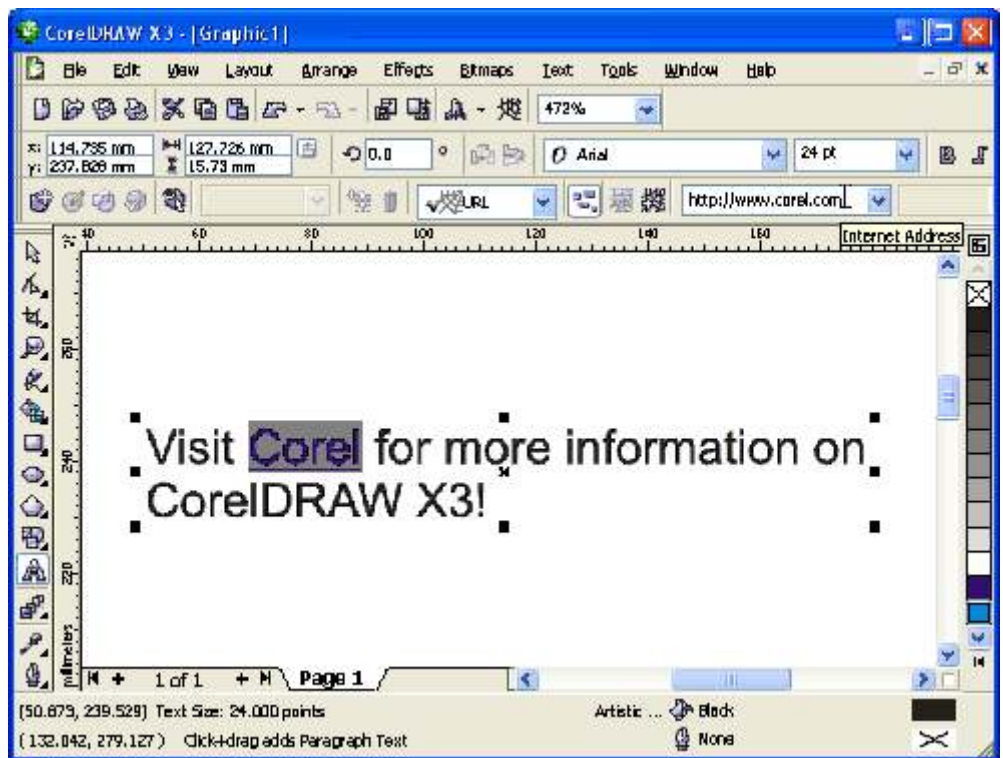

Figure 2 It is now easier than ever to add a hyperlink to individual characters.

[5]'Goal Composition: Extending Task Analysis to Predict Things People *May* Want to Do'

and host on your web page. This high level objective is clearly made of many smaller sub-goals.
One such goal might be creating hyperlinks to other web pages within the document's text. In the
past, not all text could have individual words hyperlinked – this could be a major frustration when
you know your PDF needs to link to other web pages. A feature I worked on ensured that any
words or objects could be hyperlinked, a task that, as you can see, is used often for supergoaling.

Integration Mechanisms

Integration mechanisms ensure that the features of a program can be used in conjunction with
system facilities. These mechanisms include interleaving, suspension and postponement, result
passing, and automated use.

Interleaving

With interleaving, users can accomplish other goals at the same time as the goal at hand. Certain
features of CorelDRAW do no allow for interleaving – the user must finish the current goal before
continuing with another. Such is the case when formatting bullets, drop caps, or columns for text.
However, even in situations like these, users are always able to switch between CorelDRAW and
other Windows programs to accomplish more than one thing at a time.

Suspension and Postponement

When in the middle of a task, a user might need to change gears and work on something else.
However, he will not appreciate losing his partially completed work, and will fully expect to be
able to pick up where he left off when he is ready. Besides the obvious example of standard
saving procedures that all programs offer, CorelDRAW also has other mechanisms to support
suspension and postponement. There are many ways users can customize a process to their needs

and save the changes made up to a certain point, to be recalled again later. For instance, while changing settings in the print setup, users can save the current state of settings to be recalled and further modified in the future.

Result Passing

An example of CorelDRAW's result passing support can be found in its text import filters, an area that I have worked on to improve accuracy of results. Users

Figure 3 I am about to recall some custom print settings I had saved earlier.

can create a document in Corel WordPerfect or Microsoft Word, and pass the result to CorelDRAW by importing the text, graphics, and tables from the document into CorelDRAW for further editing and layout.

Automated Use

Automated use is very similar to supergoaling, with one difference: in supergoaling, the human user must take action, while automated use will involve the computer doing the work unassisted. For example, CorelDRAW's spell checker will mark misspelled words without any human intervention, an example of automated use.

User Control Mechanisms

This section will look at three of the six user control mechanisms, each of which allow the user "to inspect and change the way the computer carries out [his] instructions."[6] The six mechanisms are monitoring, result investigation, recording and retrieving, alternative enumeration, reverting,
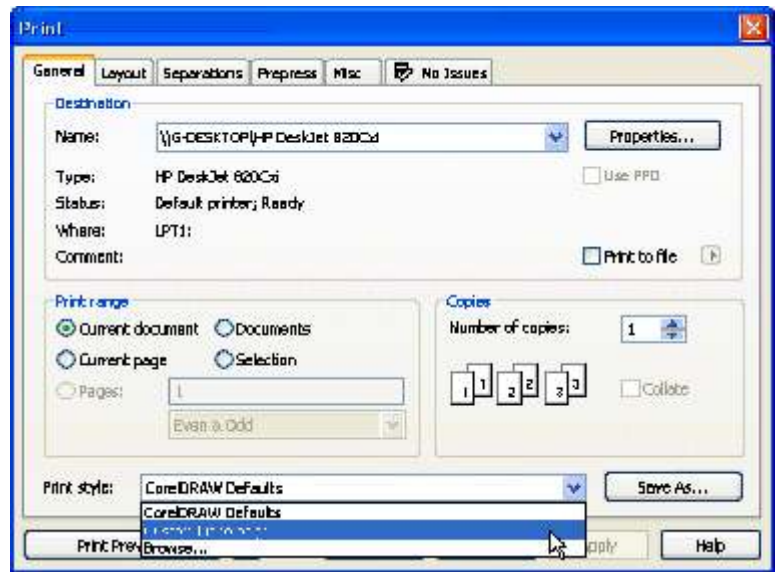
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[6]'Goal Composition: Extending Task Analysis to Predict Things People *May* Want to Do'

and modification and editing.

Result Investigation

When users want to add or adjust bullets, drop caps, or columns from CorelDRAW's dialogs, they will often be unsure about whether the settings they have adjusted will have behave the way they expect. That's why these dialogs have preview buttons – with one press, users can investigate the results without yet committing to them.

Figure 4 One can use the preview button to investigate how a bullet will look before applying changes.

Recording and Retrieving

CorelDRAW's undo docker[7] keeps a running list of all actions performed by the user, in the order they are performed. The actions can then be examined, undone, or redone. They can even be saved as a script that can be loaded again later. In this way, CorelDRAW is supporting the user's need for keeping track of what was accomplished, the key to the recording and retrieving mechanism.

Modification and Editing

In addition to being able to cancel an operating like applying a bullet and starting all over to get the settings just right, users should have the ability to apply the bullet and later adjust individual settings until it looks just right. This support for modification and editing used to be mediocre for bullets; certain values were very difficult to fine tune without messing up other values. Making this process easier was part of a feature I worked on last summer for bullets.

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[7]A docker is a dialog that can be attached to the side of the workspace and be kept open while working on a document.

CorelDRAW and Principles of UI Design

In an article on his Ask TOG web site[8], Bruce Tognazzini discusses what he believes to be the first principles to consider when designing any traditional or web based interactive application. He notes that the most effective interfaces are understood by simply looking at them, and give users a sense of control while remaining forgiving.

CorelDRAW makes generous use of many of these principles in an effort to help users do their work efficiently and effectively. There is, as with any piece of software, also some room for improvement. This section will explore both how CorelDRAW makes effective use of five of Tognazzini's principles, and how it might further build on its strengths in the future.

Anticipation of Users' Needs

Good software will be able to anticipate the needs of its users early, and present them with the information they need as they need it.

Often the only help a user can get is through the generally massive maze of help files available from the Help menu. While this is a valuable resource, it can be difficult for even the most advanced user to find what he doesn't know he's looking for. After all, finding out how to use a tool you don't know the name of is not a trivial task.

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[8]'First Principles of Interactive Design.'

CorelDRAW solves this problem with its new Hints Docker. Every time a new tool is selected from the tool box, basic information about how to use it appears in the docker. In addition, links to other help topics explaining some of the most common tasks performed with the tool are given at the same time. In this way, CorelDRAW is predicting what information the user may need and preventing him from having to search for it.
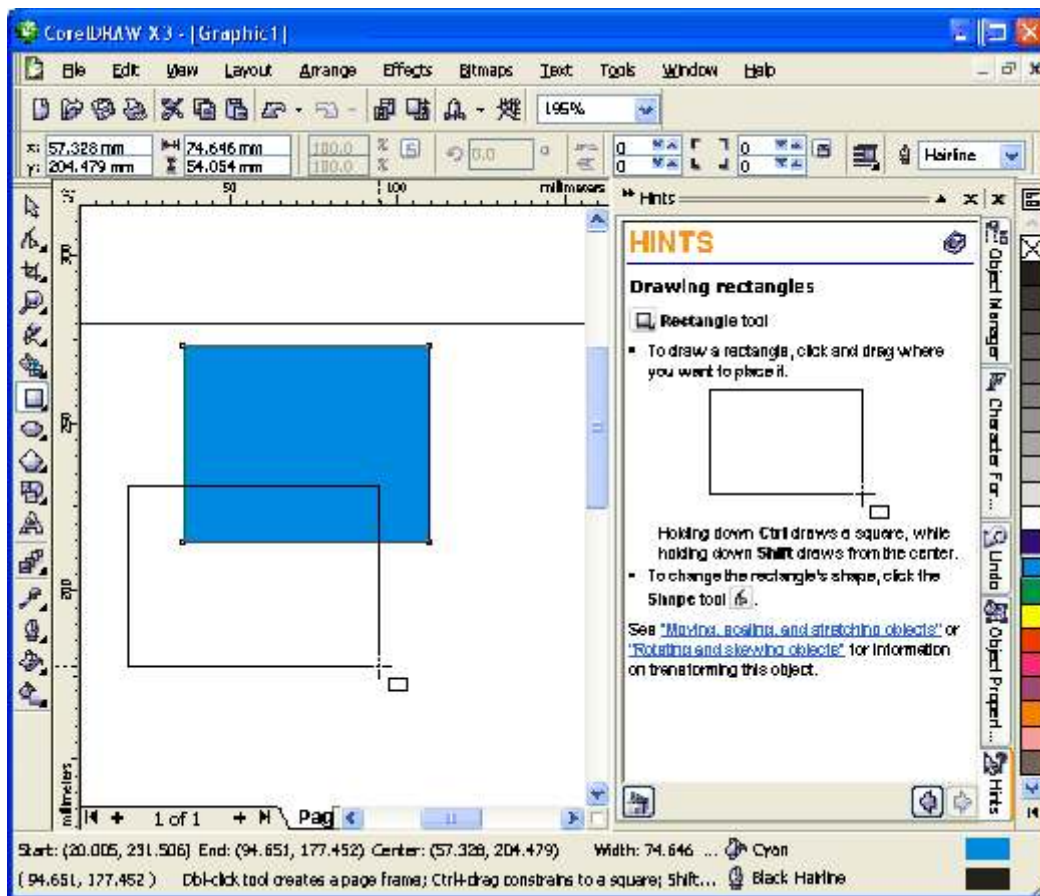
Defaults

According to Tognazzini, "defaults should be 'intelligent' and responsive."[9] One of the features I worked on last summer, as mentioned, involved bullets. One of the changes was to improve the default settings used when applying a bullet.

These defaults used to be unattractive and clumsy. Users were forced to adjust them every time they added bullets to their paragraphs. They were certainly not very 'intelligent.' The feature's implementation brought forth much more sensible defaults. Feedback from users has proven that they no longer need to fiddle with settings every single time they apply a new bullet.

While there has been great success with bullets, there are other areas of CorelDRAW's default handling that could use some attention. For instance, trying to set up global options and save them can be terribly confusing.

There is a menu command named Tools > Save Settings As Default. Not only is it unclear what settings exactly are being saved, the word Default is somewhat misleading. According to the CorelDRAW help files[10],

> Many application settings apply to the active drawing only. These include page layout options, grid and ruler settings, guideline settings, style options, save options, some tool settings, and Web publishing options. Saving the current settings as defaults lets you use the settings of the active drawing for all new drawings you create.

So this menu command is actually just saving some document settings as 'default' to be used for every new document.

A novice user would be left with many questions. How do I know what settings are saved when I choose this command? How do I know it worked when there is no feedback at all? How do I save

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[9]'First Principles of Interactive Design' > Defaults

[10]CorelDRAW Help Topics > Saving defaults

other application settings?[11]

Fixing this usability issue was a formal suggestion I made to be considered for the next version of CorelDRAW.

User Efficiency

Several concepts come together when discussing user efficiency. For instance, software designers should consider not the efficiency of the computer itself, but the efficiency of the user – people cost more than machines. It is also important to always keep the user occupied, as time is money.

Many of CorelDRAW's new features for X3 were designed with user efficiency in mind. Some have already been mentioned: improving the text filters so imported text can be used as is; altering the bullet defaults so changes for them are seldom used; and adding a hints docker so users don't have to search for help information.

Figure 6 I drew a square and a star, and used the smart fill tool to fill the overlapping portion with a different colour.

One of the features not yet mentioned is the Smart Fill tool, used to create fills for any enclosed area. Although fills can easily be applied to regular objects and closed paths, it is often desirable to fill in the open spaces between overlapping objects and open or closed paths. This used to be a difficult and often frustrating task. The new tool greatly increases user efficiency while drawing.

Not all new features added to X3 were as successful in increasing user efficiency, however. Consider the new text formatting dockers. The intention was to reduce clutter and make settings

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[11]Workspaces can be used to save some of the other application settings. Users can adjust settings in the 'workspace' category in the program's options dialog and save various named workspaces with different settings. This is completely disjoint from the menu command in question.

more accessible by moving content from the old modeless formatting dialog into more accessible dockers. While the dockers are much nicer than the old dialog, some poor design decisions have lead to perhaps an even less usable design.

First, not all information is contained within the dockets. Bullets, drop caps, and columns are all edited via modal dialogs which are only accessible from the Text menu. Second, the remaining settings are separated into two dockers: the character formatting docker accessible from the text toolbar, and the paragraph formatting docker accessible only from the Text menu. That makes five different places a user must go to format their text when they used to need just one dialog.

Fitts' Law

"Fitts' law is a model of human movement, predicting the time required to rapidly move from a starting position to a final target area, as a function of the distance to the target and the size of the target."[12] According to this law, using larger buttons and icons pinned at the edges of the screen will allow users to work more quickly.

One huge advantage that CorelDRAW has over its competitor, Adobe Illustrator, is its concept of dockers. The toolbox and colour pallette snap to the edges of the screen in CorelDRAW, whereas Illustrator is based on a model where everything is floating over top of the document. Not only is it much easier to rapidly move the mouse to the very edge of the screen than have to stop anywhere before that, but CorelDRAW's dockers do not get in the way of the document view.

State Tracking

Software should track state because users both want to know where they have been, and make use of what they have done. The discussion of the undo docker in the context of recording and

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[12]Fitts' law - Wikipedia, the free encyclopedia

retrieving provides an excellent example of tracking state.

Another good example of tracking state can be found in CorelDRAW's Image Adjustment Lab. Users can make basic adjustments to their bitmap image and save snapshots of their progress. At any time, they can revert back to any snapshot or the original and continue making changes from there.
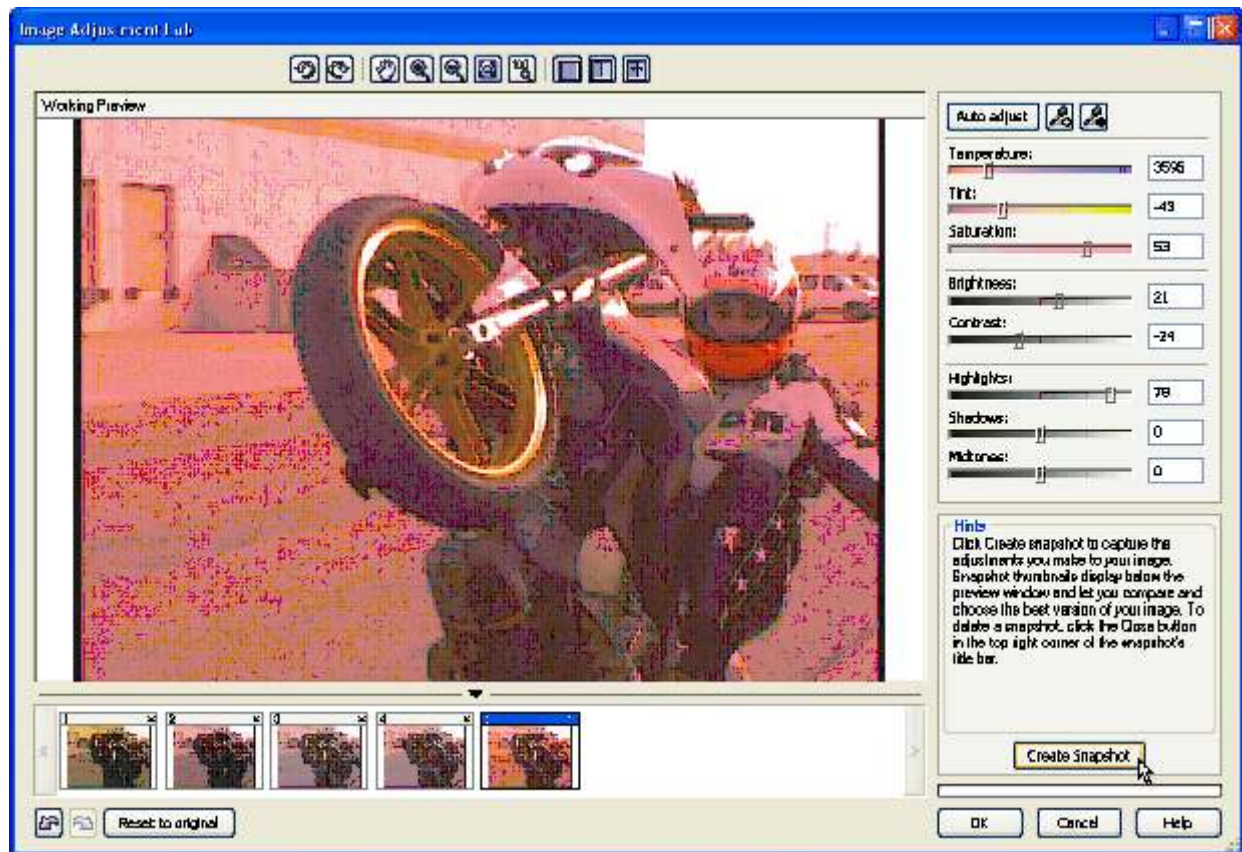

Figure 7 The image adjustment lab with a few snapshots of progressively changing settings.

Conclusion

In addition to all I have learned about CorelDRAW as a product and about applying usability concepts in a practical setting, I have gained experience not mentioned in this work term report. For instance, I have learned about the many issues involved when mixing right to left text, such as Arabic or Hebrew, with left to right text, like English. I have gained a deeper understanding of how text is input for Far East languages like Chinese and Japanese. I have had the opportunity to write some design documents, and give presentations to others.

Corel is an excellent place for anybody to work, and can offer a lot to a co-op student that is willing to learn. I have a great appreciation for what I was able to accomplish here, and would recommend it to anybody looking for a meaningful co-op work term.

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