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Attached is the Usability Test Report, which signifies the completion of our study of the AutoCAD 2006 help systems. Our test evaluated the usability and quality of the help systems, focusing on the New Features Workshop and the Info Palette.

First, we conducted an evaluation of the help systems based on heuristics and experience to predict problems that users may have with the help system. After our evaluation of the help system, we made predictions on what problems the participants would encounter. Our predictions were that:

- Users will not understand the relationship between the traditional help, New Features Workshop, Info Palette, and Quickstart links.
- The New Features Workshop does not provide enough constructive information for users to complete a task.
- The content accessed through the Quickstart links will not match users' expectations.
- Users will not be able to find information they are looking for if they don't know the specific name of a feature.
- Users will not leave the Info Palette open.

Next, we designed an experiment in which the participants would complete three scenarios using AutoCAD 2006. The scenarios required the participants to use functionality that would be unfamiliar to them to increase the likelihood that they would seek help. Then we conducted the study with six participants.

We found that our predictions were correct. Participants did not understand that the different help options provided them with different information. If they couldn't find what they wanted in one help option, they usually didn't seek help anywhere else. Participants were excited about the New Features Workshop, but they expected it to provide more detailed constructive information. Participants expected the Quickstart links to lead to constructive information, not conceptual information, but usually ignored the links completely. Participants also had a difficult time finding topics that were helpful because they did not know what terms search for. Participants had a difficult time finding the Info Palette, and did not leave it open. Participants actually searched in traditional help for the term "info palette" expecting to find how to access it.

Based on the results of the study, we have the following recommendations to improve the help systems:

- Create a single entry point for all help options.
- Integrate the New Features Workshop and the traditional help into one and make it so users can roll it up or dock it.
- Create an overview of the help options to familiarize users with the purpose of each and how to access them.
- Provide more animations for procedures, but use shorter steps and allow users to pause the animation and replay sections.
- Add complete procedures for every topic so that users do not encounter "No procedures for this topic."

Thank you for the opportunity to evaluate one of your products. Please do not hesitate to contact us if you have any questions about the project that are not addressed in our report.

Usability Study Final Report

**Evaluation of the help systems in
Autodesk's 2006 Version of AutoCAD**

May 11, 2005

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Executive Summary

In response to Autodesk's request for usability testing of the help systems in AutoCAD 2006, we performed a formal usability test with participants who were representative of product users. We tested six users with varying levels of experience—two novice, two intermediate, and two advanced.

We conducted our test in two separate usability labs. We observed the participant from another room while they completed a range of tasks using functionality new to AutoCAD 2006. Testing new functionality forced participants to use the help systems rather than rely on previous experience.

The test results and post-test interview revealed several strengths and weaknesses in the help systems, as detailed in this report. The following table briefly reviews the most significant usability problems and gives our recommendations for addressing them.

Problem	Severity	Recommendation
1. General		
1.1 Help systems are not linked together.	Severe	Create a central location for all help. Resizeable palette with multiple tabs that users can dock, roll up, or alt-tab to access as a separate window.
1.2 Traditional Help provides conceptual information first when most users want procedural information first.	Moderate	Traditional Help should start with a list of procedures. Have option to click on animations or conceptual information.
1.3 Users want the information in traditional Help and the NFW but will not visit more than one help system.	Moderate	Create a central location for all help.
2. Quickstart Links		
2.1 Users assumed that the information they found using a Quickstart link was all the information available on that feature.	Moderate	Have Quickstart links take the user to the central location for the help system. However, until that complete system is designed, the Quickstart links should take users to the constructive information in traditional Help.
3. New Features Workshop		
3.1 Graphics were hard to see and text was too small to read.	Severe	Create better quality graphics and text.
3.2 Speed of animations was too fast for some and too slow for others.	Moderate	Enable users to control pace of animations and to access specific sections within an animation by selecting from a list of steps.
3.3 Animations were too complex.	Severe	Simplify animations to show only one concept at a time.

<p>3.4 Users could not work in the drawing window while viewing the procedural animations.</p>	<p>Severe</p>	<p>Enable users to view the NFW as a floating window that can be docked or rolled up.</p>
<p>4. Info Palette</p>		
<p>4.1 Users found “No procedures for this topic.”</p>	<p>Severe</p>	<p>Create a central location for all help so that all features have procedural information when available; provide link to conceptual information.</p>
<p>4.2 Users could not find the Info Palette.</p>	<p>Severe</p>	<p>Create a central location for all help.</p>
<p>4.3 Users could not use the Info Palette without knowing a command.</p>	<p>Severe</p>	<p>Include search and index options within the centralized help system that can be docked and rolled up.</p>

Introduction

In response to Autodesk's request for usability testing of the help systems in AutoCAD 2006, we performed a formal usability test with participants who were representative of the product users. We tested six users with varying levels of experience—two novice, two intermediate, and two advanced.

We conducted our test in two separate usability labs. We observed the participant from another room while they completed a range of tasks using functionality new to AutoCAD 2006. Testing new functionality forced participants to use the help systems rather than rely on previous experience using a tool.

This report contains the following sections:

- **Background**—describes the purpose for this usability study and our predictions.
- **Goals**—describes our goals, objectives, and test questions for this study.
- **Methodology**—describes the processes we followed to design and conduct the test, select participants, and develop criteria to measure results.
- **Results**—describes the types of data collected and presents the findings of the test.
- **Recommendations**—provides recommendations based on the findings.
- **Conclusion**—summarizes the results and discusses reasons to address the problems identified in the test.

Background

In their current form, no single help system in AutoCAD 2006 can answer a user's questions about a feature of the software. Autodesk believes that users will view the New Features Workshop, Info Palette, and traditional Help as components of an integrated help system. When viewed in combination, the help system should provide a comprehensive overview of AutoCAD features along with constructive information on using those features. However, this view may not be realistic. For example, when a user is working with a new feature such as sheet sets the user will see a Quickstart link stating, "Learn more about Sheet Sets." When the user clicks on this link, they are taken to the NFW, which provides conceptual information about Sheet Sets. While it provides some constructive information, it is not detailed or complete.

Both the testing team and Autodesk staff predicted that this might be confusing for the user because they are probably expecting constructive information. When users are trying to complete a new task for the first time, they often do not read conceptual information; instead, many users are "driven to be productive, to learn by doing, not by reading" (Barnum 108). The idea of "minimalism" for adult learners is based, in part, on the belief that "Users want to be actively involved in learning right away" (Barnum 111). Van der Meij states, "The ultimate goal of the user of a manual is always doing.... Users attend to procedural information almost three times as often as they attend to conceptual information" (212).

In addition, if the content behind the Quickstart link does not match the user's mental model, they will likely feel frustrated. We know that "When objects communicate logically, intuitively, and consistently, users experience a high degree of success with the match to their mental models. When they do not, users are frustrated, frequently blaming themselves for failing to understand" (Barnum 109). We predicted that if users click on the Quickstart link hoping to find constructive/procedural information so they can start "doing," but find conceptual information, they will likely become frustrated.

When users consult a Help system they are often in "reading-to-do mode," meaning they are consulting the information to complete a task or solve an unexpected problem (van der Meij 212). This is even more important for expert users, who need and want just enough information to get them started; the focus of information for this population should be on completing a task (Barnum 112). Even when users are in "reading-to-learn-to-do mode," they still only want information to help them do their work. However, in both modes, users "need conceptual as well as procedural support and not just one of the two" as in the

Dynamic Blocks section of the New Features Workshop (van der Meij 212). For this reason, we predicted the information provided in the Dynamic Blocks section of the NFW might be appropriate as presented.

Another example of an AutoCAD Help system is the Info Palette. To find information about a task in this system, users must know the name of what they are trying to do (such as Sheet Sets). If users are familiar with the terms used in the Help system, they should have no trouble searching with the appropriate term. However, we suspected that not all users would be familiar with the Autodesk terminology, meaning they would not know which terms to look for. Barnum states, “If the help topics are categorized by the features of a tool and not by the tasks that users want to accomplish, help will not be helpful, because the terminology of the tool is unknown to the user” (109).

Table 1. Predictions

Feature	Prediction
General	<ul style="list-style-type: none"> • Users will not understand the relationship between the traditional help, New Features Workshop, Info Palette, and Quickstart links.
New Features Workshop	<ul style="list-style-type: none"> • The New Features Workshop does not provide enough constructive information for users to complete a task.
Quickstart links	<ul style="list-style-type: none"> • The content accessed through the Quickstart links will not match users’ expectations.
Info Palette	<ul style="list-style-type: none"> • Users will not be able to find information they are looking for if they don’t know the specific name of a feature. • Users will not leave the Info Palette open.

Goals

This usability test of the AutoCAD help systems gathered quantifiable data addressing Autodesk’s concerns about the usability of the many AutoCAD help systems. We assessed participants’ ability to use the help systems to complete challenging tasks in AutoCAD. While participants performed these tasks, we collected information on how they use or expect to use the AutoCAD help system. We were particularly interested in if and how participants interacted with the Quickstart links, the New Features Workshop, and the Info Palette.

Objectives

The purpose of the test was to:

- Identify how users perceive the relationship between the parts of the suite of help systems.
- Determine where users go for help when they are trying to complete a new task.
- Determine how users predict the content behind Quickstart links.
- Determine whether users can obtain adequate information from the NFW or Info Palette to complete a task.
- Compare the content of the NFW and Info Palette to determine which results in higher performance for participant tasks.

Test Questions

General

- What help systems do users go to first when they need help?
- Will users look beyond the obvious “Help” option in the Help menu and explore other sources of help?

Quickstart Links

- Will users find and access the Quickstart links?
- What type of information do users expect when they select a Quickstart link?

- If users select the Quickstart links and fail to get necessary information, will they seek further help from other sources?

New Features Workshop (NFW)

- Can the users find the NFW?
- Does the NFW provide the type of information users expect? Need?
- Where will users go if they cannot find what they need in the NFW?

Info Palette

- Can the users find the Info Palette?
- Will users keep the Info Palette easily accessible?
- Does the Info Palette provide the type of information users expect? Need?
- Where will users go if they cannot find what they need in the Info Palette?

Methodology

We conducted a between-subjects usability test using six participants, all of whom were existing AutoCAD users. We provided the participants with task-based scenarios and asked them to complete the tasks in AutoCAD using concurrent think-aloud procedures. Prior to the actual usability test, we asked participants to practice thinking aloud while completing a warm-up task unrelated to AutoCAD (Appendix C). Once participants were proficient with this procedure, they were allowed to move on to the usability test. Each session lasted approximately 90 minutes.

Participants

According to the developer's Web site, "AutoCAD® software is the world's leading customizable and extendable CAD software for 2D drafting, detailing, design documentation, and basic 3D design." Designers, drafters, and engineers around the world use AutoCAD. It is a platform technology that spans many design industries including architectural, civil, and manufacturing. The AutoCAD user base can be divided into many different categories; however, for the purpose of this study, we defined three user categories based on user ability: novice, intermediate, and advanced.

User Profiles

Novice Users

We assumed that novice users have used AutoCAD for less than three years and that they rank their level of ability as low on all AutoCAD functionality. Novice users might include students or entry-level drafters with minimal AutoCAD experience. They can draw basic geometry (lines, arcs, and circles) and perform common editing tasks (copy, move, rotate) but have minimal experience with more advanced tools such as blocks and external references.

Intermediate Users

We assumed that intermediate users rank their level of ability as high for basic functionality (block definitions, external references, arrays, object snaps) and low for advanced functionality (customizing tool palettes, menus, LISP, and so forth). Intermediate users include the majority of AutoCAD users. They may be relatively new to AutoCAD or they may have been using AutoCAD for many years. They know how to draw and edit with efficiency by taking advantage of more advanced functionality. They can define blocks and attach external references. They can use blocks with attributes but may be less comfortable defining attributes. They may use a custom user interface (UI) defined by their CAD manager but they do not customize the UI or create custom applications themselves.

Advanced Users

We assumed that advanced users rank their level of ability as high for all aspects of AutoCAD functionality. Advanced users are always looking for the most efficient way to work in AutoCAD. They are typically CAD

managers or senior CAD operators and they are comfortable with customizing the AutoCAD UI to suit their needs. They often set CAD standards and train other operators how to use AutoCAD and follow standards.

Recruiting Process

Autodesk helped us with the recruiting process by posting our request for participants on an Autodesk Blog. The Blog included a link where users could enroll as potential participants in the study. As part of the enrollment, users responded to survey questions, which provided background and contact information. Most of the responses came from intermediate or advanced users. To find novice users, we solicited participants through other sources including personal contacts and local AutoCAD instructors.

After participants volunteered, we had potential participants take a recruiting survey (Appendix G). Their responses to the survey (Appendix H) helped us determine which category they belonged in and helped us ensure they had no prior experience with the functionality we were using in the test scenarios.

Context of Product Use in the Test

AutoCAD users are diverse in many ways including their disciplines, work environments, and software environments. Unless we design and conduct the tests on-site for each user, there will be differences between the test environment and the user's work environment. The most significant factors that might contribute to differences in environment include:

- Content – AutoCAD users come from a variety of disciplines including architectural, manufacturing, civil, and many more. A participant's familiarity with a particular discipline can influence how much he or she can relate to the test tasks and drawings. Even a user who is familiar with a particular discipline may find it considerably more difficult to work with project files that relate to a different discipline.
- Work environment – AutoCAD users can work in a variety of office environments. Some have private offices; some have cubicles, some work in a large open room with many other coworkers, and some work remotely. Some environments are loud and chaotic while others are quiet and slow. Some have state-of-the-art hardware while others can barely run AutoCAD. All of these factors can affect how well a participant might perform in a test environment.
- Software environment – Unlike most software applications, AutoCAD is highly customizable. Approximately 90 percent of AutoCAD users work on a customized version of AutoCAD and many of them may not even realize it. When a participant is faced with default installation of AutoCAD after working on a customized version for months or years, the differences can be overwhelming. The participant may feel lost before he or she even starts.

Although it is impossible to design a test that matches every user's work environment, we tried to design the test in a way that would match most users. We created test scenarios, which used functionality that would be valuable to users from any discipline and we created the tasks so they were not heavily dependent on drawing content. We conducted the tests in an office environment where the participant was located in a small office or workstation and the investigators sat out of sight. To ensure that all participants were working with the same interface, we restored the AutoCAD environment to a default workspace prior to each session.

After the test session, we asked participants how they felt about the testing experience. We were interested in other factors that might have influenced their performance during the test, such as the Web camera or thinking-aloud. We found no significant influence from other factors. In fact, the participants seemed to forget about the Web camera and several of them commented that they always talk to themselves at work.

Scenarios and Tasks

During the test sessions, we provided participants with three separate scenarios, each of which focused on a specific feature in AutoCAD. We began each scenario by reading a brief description of the scenario to the participant and then providing him or her with a handout for that scenario (Appendix I). Each scenario included two tasks that were designed to be challenging enough to require participants to seek information from the help systems. We allowed participants to work on each scenario for approximately 20 minutes. If a

participant did not complete all of the tasks in the scenario within the allotted time, we asked him or her to move on to the next scenario.

The first scenario required participants to use Sheet Set functionality. The scenario handout included hardcopy output for a project containing seven sheets and it provided the location of a project folder containing the drawings and template files that were used to produce the hardcopy output. For the first task, participants were instructed to organize the drawings into an electronic sheet set that corresponds to the hardcopy. For the second task, they were instructed to configure the electronic sheet set to use the Project A template file when creating new sheets. Participants were encouraged to explore AutoCAD and use any means necessary to help them perform the tasks.

The second scenario required participants to use Dynamic Block functionality. The handout included images of a callout block and a view label block and provided the location of a drawing that contained the block definitions. For the first task, participants were instructed to update the callout block so that the arrow could be rotated to point up, down, left, and right. For the second task, they were instructed to update the view label block so that the line beneath the view title could be stretched. Participants were encouraged to explore AutoCAD and use any means necessary to help them perform the tasks. However, if they required help, they were asked to begin with the New Features Workshop.

The third scenario required participants to use Customize User Interface functionality. The handout included an image of a customized user interface and provided the location of a custom MNU file containing toolbar and pull-down menus. For the first task, participants were instructed to add the custom menu and toolbar to the main AutoCAD 2006 menu file. For the second task, they were instructed to configure their user interface to match the image that was provided and then save it so they could switch between the default AutoCAD 2006 interface and their customized interface. Participants were encouraged to explore AutoCAD and use any means necessary to help them perform the tasks. However, if they required help, they were asked to begin with the Info Palette.

In AutoCAD, there are multiple ways to accomplish a task. Often, users will choose the methods that are most familiar to them, even if those methods are less efficient than other methods available in AutoCAD. To minimize this potential variance between test participants, we tried to design tasks with very specific solutions that would require participants to use new and unfamiliar functionality, thus forcing them to seek help. Since our primary objective for this usability study was to learn more about how the participants use the AutoCAD Help system, we were somewhat lenient on the criteria for accomplishing the tasks. We used the following criteria to determine if participants successfully completed each of the tasks:

Scenario 1

Task 1

- The participant created a sheet set with at least 5 of the sheets and did not realize there were more.
- All of the sheets in the sheet set were in the right order or the participant did not realize the sheets were not in the right order.

Task 2

- The participant assigned the template file to the Create New Sheet property for any sheet set.

Scenario 2

Task 1

- The arrow in inserted callout block could be rotated.
- The line and text in the inserted callout block did not rotate with the arrow.

Task 2

- The line in the view label block could be stretched.
- No other objects in the view label block moved when the line was stretched.

Scenario 3

Task 1

- The participant loaded the MNU file using the CUI or the participant loaded the MNU using the MENULOAD or CUILOAD commands and verified that the menus were actually loaded.

Task 2

- The participant turned on the Workspaces toolbar and changed the visibility of at least one other user interface element.
- The participant saved a named workspace.

Test Facility

The tests were conducted at the University of Colorado, Denver campus and in the home of one of the investigators. The participant was provided with a laptop computer including an external keyboard, mouse, and microphone. We also used a Web camera to monitor the participant and we used Camtasia to record the screen, the camera feed, and the participant's verbal comments.

Results

This usability study uncovered several positive aspects of the AutoCAD help systems. Most participants were very fond of the NFW. While the information could be improved upon, many participants were very excited about its features. Two people commented that they are visual learners and prefer graphics to text. Four of the participants kept the NFW window open so they could easily toggle between the animation and the drawing area.

However, the study also uncovered some problems, as we will describe as we answer the test questions below. We conclude this section with a list of recommendations for improvement.

General

What help system(s) do users go to first when they need help?

In Scenario 1, where users were not prompted regarding which help system to access, three out of four participants who accessed help without being prompted went to traditional Help first. The fourth participant accessed the NFW through a Quickstart link. No participants accessed the Info Palette at any point without being prompted.

Scenario 1 was the only time participants were not "instructed" as to which help system to access first. In fact, in the instructions for the scenario, we made no mention of accessing help in any way. For the remaining two scenarios, we instructed participants to use either the NFW or the Info Palette first if they needed help. In Scenario 1, four out of six participants accessed help without being prompted. Of those four, three participants (or 75% of participants who accessed help) went to traditional Help first. One participant accessed the NFW. Another participant accessed the NFW through a Quickstart link after accessing traditional Help (see Table 2).

Two participants did not access any form of help; however, they were also the only participants who completed both tasks in Scenario 1, meaning they did not require help. They both used the wizard to complete the tasks.

Table 2. Accessing Help without Prompt

Scenario 1	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
User accessed a help system without being prompted.	Y	Y	Y	N	Y	N
Which?	NFW	Help	Help	-	Help	-
User accessed second source of help	N	N	N	N	Y	N
Which?	-	-	-	-	NFW	-

Even when participants were directed to begin with a particular help system, as in Scenario 2 where they were told to use the NFW, two of six participants who accessed help actually went to traditional Help first. During Scenario 3, where participants were directed to access the Info Palette first, four of six participants (66%) still accessed traditional Help at some point during the scenario.

These findings lead us to believe that traditional Help is the resource most users go to first when they need more information. In fact, one participant commented with frustration while trying to find the NFW, “Why can’t I just go to Help? If you got a new name, which no one is familiar with... People are familiar with Help!”

Additional Observations

While two participants who accessed traditional Help made progress towards completing the tasks with the information, one did not complete either task and one only completed one of the first two tasks in Scenario 1. Users who completed the tasks used the wizard to do so.

Will users look beyond the obvious “Help” option in the Help menu and explore other sources of help?

Most participants did not explore additional sources of help beyond the traditional Help. In Scenario 1, only one (advanced) participant went past traditional Help to view a secondary source of help and that was after over 19 minutes of trying to complete the second task.

In Scenario 2, where participants were directed to go to the NFW first, two participants actually accessed traditional Help first. When they both could not find the information they needed in Help (because they were not sure what to look or search for) they then went on to open the NFW. In fact, one (novice) participant opened traditional help after only 13 seconds on task. He did not open the NFW until 6.5 minutes into the task.

No participants accessed the Info Palette after viewing traditional Help.

Additional Observations

Unlike with traditional Help, other sources of help did not provide enough procedural information in many cases for participants to complete a task. The one participant who went past traditional Help to the NFW did make progress to completing the second task. This participant accessed the NFW through a Quickstart link, and while the information was helpful, this participant only read the first page of the NFW and closed it soon after seeing the second page. The overview provided assurance that she was on the right track but did not provide the procedural information for her to complete the task.

Quickstart Links

Will users find and access the Quickstart links?

Only two of the six participants accessed a Quickstart link during all sessions we conducted, and each of them only used the link once during Scenario 1. The two participants who used the Quickstart link were more

successful with the tasks--one completed both tasks and the other completed everything but ordering the sheets within the set. They both used the information they found from the Quickstart link to help them with the tasks (See Table 3).

Table 3. Quickstart Link, General Results

	Scenario 1	Scenario 2	Scenario 3
# of exposures	14	0	8
# of clicks	2	0	0
info helped w/ task	2	0	0
looked for additional help	0	0	0

Participants were most often exposed to Quickstart links through the Create Sheet Set Wizard in Scenario 1. The number of times that the participant was exposed to a Quickstart link did not correspond with the number of times they clicked on one. In fact, the only two participants who clicked on the link were exposed three times less than other participants (See Table 4).

Table 4. Quickstart Link, Number of Exposures vs. Number of Clicks

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
# of exposures	1	3	4	7	3	4
# of times accessed	1	0	0	0	1	0

What type of information do users expect when they select a Quickstart link?

Participants did not know what to expect from the Quickstart links. Most of the time, the links were completely ignored (See Table 4). One participant hovered over the link on the Create Sheet Set Wizard and said, “I don’t need that,” although he was searching for information about how to create a sheet set. The other participant who clicked the link was excited by what she found, saying, “This is neat. This is exactly what I want to do.”

If users select the Quickstart links and fail to get necessary info, will they seek further help from other sources?

Both participants who accessed the NFW through a Quickstart link in Scenario 1 did not go on to access additional help from other sources. Participants felt the information provided in the NFW allowed them to make progress toward completing the task and they did not require additional information. However, of those two participants, only one (advanced) user was able to complete both tasks in Scenario 1. The other (novice) user did not complete either task.

Additional Observations

In most cases, participants did not notice the Quickstart links. Those who found the links to be helpful in Scenario 1 did not use them when they were exposed in Scenario 3. This may be because they were more familiar with the help options under the Help menu and this was their first choice when looking for help.

New Features Workshop (NFW)

Can the users find the NFW?

Accessing the NFW from the Help menu was not a natural instinct for any of the participants. In the first scenario, where participants were not guided toward a particular help system, only two of the participants accessed the NFW. They both found it by selecting the QuickLink in the Sheet Set Manager dialog box.

In the second scenario, where participants were directed to the NFW as a first means of finding help, two of them still tried the traditional Help system first. One participant worked on the task unsuccessfully for 6.5 minutes before rereading the instructions and noticed the instruction to use the NFW. Another participant

worked on the task for 15 minutes before the investigator intervened and pointed him to the NFW, at which point he actually tried it.

In the third scenario, none of the participants found adequate information in the Info Palette. However, even after their success using the NFW in the previous scenario, only one of the participants returned to the NFW for Scenario 3. Given these results, the question is not only can the participants find the NFW, but also will they remember to use it?

Table 2. New Features Workshop, Accessed for each Scenario

	# of Participants who accessed the NFW
Scenario 1 (no help instructions)	2 (33%)
Scenario 2 (instructed to use NFW first)	6 (100%)
Scenario 3 (instructed to use Info Palette first)	1 (17%)*
* One of the users who also accessed the NFW in Scenario 1	

Does the NFW provide the type of information users expect? Need?

The NFW provides some of the information that users expect and need. However, the information is difficult to find and too complex to understand. The first three panels in the Dynamic Block Overview of the NFW provided enough information for the users to realize they wanted to use Dynamic Blocks to accomplish the tasks in Scenario 2. However, those panels do not provide the key information that enables users to get started. One user described her expectations of help as “all I want to know is what do I do, and what do I do to get here or there.”

As we predicted, all the participants, regardless of skill level, wanted to jump in and begin working as quickly as possible. Two of the participants viewed the first three panels of the Dynamic Block Overview and then attempted to accomplish the tasks. One participant only viewed the first panel before attempting the tasks. All three of them were unsuccessful in their initial attempts at the tasks and they eventually returned to the NFW for more information. Two participants skipped the overview and went straight to the topic: “Enable part of a block to move or rotate.” Both of those participants read the first panel, which provided the name of the necessary command, and then closed the NFW to attempt the tasks. The command name was enough information for one of the participants, an advanced user, to accomplish the first task without referring back to the NFW. A different participant read the overview of dynamic blocks and then selected the animation to enable part of a block to stretch. He was ready to edit the block but became very frustrated because he could not figure out how to get into the block editor. Unfortunately, the key information he needed, the BEDIT command, is only mentioned in the animation that described how to enable a part of a block to move and rotate. Since he skipped that animation, he spent all his time just trying to figure out how to get into the block editor.

All of the participants at least scanned the conceptual information in the NFW. However, all of them were reading to do, not reading to learn. They wanted just enough information to begin performing the task. One participant described that her “experience with Help is that it is not much help.” She said, “You often get to a place where it tells you to do something, and it does not tell you how.” She indicated that when she goes to help it is because “I actually want to do something, so I need some very specific information and some step-by-step.” Two participants explicitly requested an easier way to find and access specific steps in the procedural animation. When describing the NFW animations, one participant suggested, “It needs like a drop-down for everything... more like a jump-to step or something.”

Table 3. New Features Workshop, Accessed by each Participant

Scenario 2	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
# of panels viewed before trying to work on task	10	1	3	3	1	1
# of NFW panels viewed	16	7	4	10	2	9
User scanned or read content	Read	Scan	Read	Read	Scan	scan
User accomplished task 1	Y	N	N	N	Y	N
User accomplished task 2	Y	N	N	N	N	Y

Where will users go if they cannot find what they need in the NFW?

After discovering the NFW content for dynamic blocks, none of the participants sought help from other sources. All participants seemed to feel that they were making some progress, so they kept returning to the NFW to complete the tasks in Scenario 2. In addition, it appeared that users assumed the information provided by the Quickstart link was all the information on that feature.

Additional Observations

Positive findings. All of the participants were enthusiastic about the graphical nature of the New Features Workshop. Two people commented that they are visual learners and prefer graphics to text. Four of the participants kept the NFW window open so they could easily toggle between the animation and the drawing area.

Negative findings. The New Features Workshop was the primary tool for all of the participants to learn about the dynamic block functionality required in Scenario 2. This was also the scenario where users were instructed to start by using the NFW if they needed help. Four of the six participants who accessed the NFW were disappointed at the quality of the graphics. Three participants indicated that it was difficult to read the introductory text because it faded to white on pale green before they could finish reading. One participant said, "...my eyeballs are 20-20 and I still can't read this." The animation images were very small but their readability was crucial for users to understand where to pick and how to respond to the prompts. When viewing the tool palette images in the animation, one participant said, "Oh, that's so small, I wish I could see that."

All five of the participants that were able to access the block editor found value in the step-by-step process provided by the Dynamic Block animations. However, they wanted to apply each step to their own situation as they viewed the animations. One participant switched back and forth between the NFW and the block editor at least 9 times as she tried to follow the animation. Although the participants did not seem to mind the frequent toggling, two participants requested an option to display the NFW on the side so they could view the animation as they perform the steps in AutoCAD. Participants made comments such as "Can I minimize that?" and "I wish I could dock this."

The most significant problem with the NFW was the complexity of the animation that described how to enable part of a block to move and rotate. All four participants who viewed the animation became confused and overwhelmed while attempting the first task. They did not realize that the animation combined what could have been two independent procedures and that one of those procedures was not necessary for their particular task. One novice user said, "Wow, it's going through a lot of things. Needs shorter steps." The other novice user made a similar comment: "Wow, there's quite a lot of steps to that." One of the advanced users could not overcome her confusion with the complicated animation and was unable to complete the

task. The other advanced user was the only participant who did not view the animation. She completed the task in less time and with less confusion than those participants that viewed the animation.

Info Palette

Can users find the Info Palette?

Most participants had a very hard time locating the Info Palette, and when they were able to find it, it did not provide helpful information. Not one of the six participants found any information in the Info Palette that helped them complete a task. In Scenario 3, where participants were directed to access the Info Palette first, four participants were able to open the Info Palette; however, it did not provide helpful information to any of the four. In fact, two participants could not find any procedures for the topic they were looking for. One participant clicked on several links that might have led to useful information (Customize, Menuload, Menuctl), but the links displayed the text “No procedures available for this topic.” This participant then went on to actually search for the Info Palette through traditional Help. A second participant also found “No procedures for this topic” while using the Info Palette trying to figure out CUI import.

A fifth participant tried to find the Info Palette for four minutes but was never able to locate it. He was in “zero document state,” so when he looked under the Help menu the link to the Info Palette was not available. Like the participant mentioned above, he even went so far as to open traditional Help and search for “Info Palette,” only to find conceptual information about the Info Palette. While looking for the Info Palette the participant repeated the phrase “I’m completely lost.”

The fact that two participants actually used traditional Help to search for information about the Info Palette reinforces our conclusion that most participants go to traditional Help first when trying to complete a task. In this Scenario, the task that participants were trying to complete was actually opening the Info Palette.

No participants accessed the Info Palette in either Scenario 1 or 2.

Will users keep the Info Palette easily accessible?

Users will most likely not keep the Info Palette open or docked while they work. In Scenario 3, of the four participants who accessed the Info Palette, only two left it open (50%). Even though those two participants did leave the Palette open, neither one found information in it helpful in completing the tasks. We predict that if most users find that they do not find helpful information in the Info Palette, they will likely never keep it open in the future.

Does the Info Palette provide the type of information users expect or need?

This is a difficult question to answer based on our study. Since participants only accessed the Info Palette in Scenario 3, when they were instructed to do so, there is a great chance that we helped establish their expectations for the Info Palette. By directing participants to the Info Palette, we probably gave participants the impression that the information included there would be helpful. In fact, of the five participants who accessed the Info Palette (or tried to), two expected the information to be instantly helpful. In fact, one (advanced) participant commented, “I’m still trying dutifully to use that Info Palette, but I haven’t actually come up with a command yet and I think I need a command.” Another participant (novice) commented, “This isn’t helping me at all. This is confusing me more than helping me.”

We were not able to observe participants access the Info Palette without being prompted.

Recommendations

Based on the results of the usability study, we identified problems and their severity. In this section, we give our recommendations on how to address those problems.

1. General

Problem	Severity	Recommendation
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1. General		
1.1 Help systems are not linked together.	Severe	Create a central location for all help. Resizeable palette with multiple tabs that users can dock, roll up, or alt-tab to access as a separate window.
1.2 Traditional Help provides conceptual information first when most users want procedural information first.	Moderate	Traditional Help should start with a list of procedures. Have option to click on animations or conceptual information.
1.3 Users want the information in traditional Help and the NFW but will not visit more than one help system.	Moderate	Create a central location for all help.

1.1: Help systems are not linked together.

One of the most severe problems that participants encountered is that the help systems are not linked together. For example, if participants clicked on a Quickstart link and were taken to the NFW, they seemed to assume that that information provided was all the help information available. If they did not find enough information to complete the task, they did not seek additional help.

To resolve this issue, we recommend creating a central tool for all help. The user would be taken to this central location from the Help menu and Quickstart links. This central location could be a resizeable palette with multiple tabs that users can dock, roll up, or access as a separate window using Alt-Tab.

1.2 Traditional Help provides conceptual information first when most users want procedural information first.

Most participants sought procedural information before they looked for conceptual information. Currently, traditional Help starts with conceptual information and has a tab at the top for procedures. However, most participants had a hard time finding this tab, creating frustration and a feeling they were in the wrong place. One participant commented when first opening traditional Help, "I'm looking for a command." In addition, participants liked the demonstrations from the NFW that showed how to accomplish a task, but these were not available from the procedures menu in traditional Help.

To resolve this problem, when users access the new centralized help palette, they should be presented with relevant constructive information first. An alternate tab might provide them with relevant conceptual information. Both the constructive and conceptual information could include links to simple, relevant animations.

1.3 Users want the information in traditional Help and the NFW but will not visit more than one help system.

As our results demonstrate, most users access traditional Help; however, traditional Help does not include the graphics and demonstrations that are currently in the Dynamic Blocks section of the NFW.

To resolve this problem, we recommend creating a central location for help. For more, see Problem 1.1.

2. Quickstart Links

Problem	Severity	Recommendation
2. Quickstart Links		
2.1 Users assumed that the information they found using a Quickstart link was all the information available on that feature.	Moderate	Have Quickstart links take the user to the central location for the help system. However, until that complete system is designed, the Quickstart links should take users to the constructive information in traditional Help.

2.1 Users assumed that the information they found behind a Quickstart link was all the information available on that feature.

Both participants who clicked on the Quickstart links did so in Scenario 1 from the Sheet Set Wizard. When users are in a wizard they are obviously in the midst of completing a task. When users clicked on the link to take them to new information in the middle of doing a task, they expected the link to take them to information on completing the task. However, users are taken to the NFW, which mainly provides conceptual information. Participants assumed this was the only source of help for the topic and did not look for additional help.

Building on our recommendation for a central location for Help, we recommend that the Quickstart links take the user to the relevant information within that centralized help system. However, in the meantime, we recommend having the Quickstart links take the user to the constructive information within traditional Help.

3. New Features Workshop

Problem	Severity	Recommendation
3. New Features Workshop		
3.1 Graphics are hard to see and text is too small to read.	Severe	Create better quality graphics and text.
3.2 Speed of animations was too fast for some and too slow for others.	Moderate	Enable users to control pace of animations and to access specific sections within an animation by selecting from a list of steps.
3.3 Animations were too complex.	Severe	Simplify animations to show only one concept at a time.
3.4 Users could not work in the drawing window while viewing the procedural animations.	Severe	Enable users to view the NFW as a floating window that can be docked or rolled up.

3.1 Graphics are hard to see and text is too small to read.

When users access the NFW to find help on a particular task, they are looking for detailed constructive information. They expect graphics to be legible enough for them to read and understand each step in the animations as they perform similar tasks in their drawings. When they are provided with textual information, they assume it is provided for a reason and they expect to be able to read it without straining.

To meet users' expectations for legibility in the NFW, we recommend improving the quality of the graphics and text. The graphics, including the animations, should be displayed at actual size to prevent them from becoming fuzzy and unreadable. The text on the introductory screen should maintain its contrast against the

background color rather than fading to a pale green. Although the color and size of the text within the NFW topics may be sufficient for conceptual information, additional research should be conducted to determine the optimal text color and size for step-by-step constructive information that might be added to the NFW.

3.2 Speed of animations was too fast for some and too slow for others.

When viewing the animations in the NFW, some participants felt they were too fast, while other participants felt they were too slow. They wanted to be able to pause the animations or to access a specific location in an animation without repeating the entire demonstration.

We recommend several solutions to provide users control and flexibility for viewing the animations. First, allow the speed of the animations to be controlled by the user. Second, provide a pause option within the animations. Third, enable the user to link from a list of steps to the corresponding section of the animation.

3.3 Animations were too complex.

One of the Dynamic Block animations in the NFW combines the procedure for two tasks (rotating and moving) into a single animation. This animation proved too complicated even for advanced users. When participants access the NFW for help, they should be provided with simple and distinct procedures, enabling them to succeed at the basics.

To help users succeed with the basics rather than becoming overwhelmed with complexity, we recommend providing short animations that cover a distinct aspect of functionality.

3.4 Users could not work in the drawing window while viewing the procedural animations.

Although participants found great value in the constructive information provided by the dynamic block animations, they found it cumbersome to switch between the NFW window and the AutoCAD drawing window. They wanted to view the animation while simultaneously repeating the process in their own drawings.

We therefore recommend that the ability to view animations be part of the centralized help system available from a floatable, dockable window.

4. Info Palette

Problem	Severity	Recommendation
4. Info Palette		
4.1 Users found “No procedures for this topic.”	Severe	Create a central location for all help so that all features have procedural information when available; provide link to conceptual information.
4.2 Users could not find the Info Palette.	Severe	Create a central location for all help.
4.3 Users could not use the Info Palette without knowing a command.	Severe	Include search and index options within the centralized help system that can be docked and rolled up.

4.1 Users found “No procedures for this topic.”

The primary advantage of the Info Palette over the other help systems is its ability to float and dock, enabling users to view the procedural content while working in the drawing window. However, if users cannot find the content they require, the Info Palette is useless. When participants are unsuccessful at finding the necessary information from the Info Palette, they are unlikely to try to use it the next time they need help.

Our recommendation for a centralized help system would combine the best qualities of all of the existing help systems, including the Info Palette. The procedural content would come from a single source similar to the traditional Help procedures, but would be displayed in a form similar to the Info Palette.

4.2 Users could not find the Info Palette.

As described under our results, two participants had a very hard time finding the Info Palette and actually searched for “Info Palette” in traditional Help, which they could obviously find.

Our recommendation for providing a central location for all help would alleviate the problem of not being able to find the Info Palette; users would be able to find the primary help system the same way they found traditional Help and it would provide access to all the information they need.

4.3 Users could not use the Info Palette without knowing a command.

The Info Palette displays procedural information that is relevant to the current command. However, users often seek help because they don’t know which command to use. Therefore, it is nearly impossible for someone to use the Info Palette without accessing another form of help.

Our recommendations for a centralized help system would combine the search and index functionality of traditional Help with the procedural information provided by the Info Palette.

Additional Observations

During the course of this study, we found that some aspects of AutoCAD’s design could be improved. However, we also discovered aspects of the software that participants were very pleased with and could be increased and/or improved. The recommendations below relate to these features.

The primary feature that participants employed to complete Scenario 1 was the Sheet Set Wizard. In fact, two participants were able to complete the task without accessing any help because of the wizard. For this reason, we recommend creating more wizard functionality similar to the Sheet Set Wizard. For example, a dynamic block wizard that guides users through the process of adding parameters and actions by providing descriptive information and requesting necessary input could be extremely valuable.

Another feature that participants were very happy with was the NFW. One participant commented, “This is so cool.” And the fact that participants continued to return to the animations, in one case up to 11 times, is a testament to the usefulness of the demonstrations. For this reason, we recommend creating more animations for procedures in AutoCAD. However, we also recommend that these additional animations follow the recommendations described under Problems 3.1-3.4.

Conclusion

[Summarizes the results and discusses reasons to address the problems identified in the test.]

Appendices