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COMP 485: Human Computer Interaction

10 May 2013

Analysis of UI Strengths and Faults in Windows 8 Metro and Ubuntu Unity 12.10

Abstract:

Both Windows Metro and Ubuntu Unity are revolutionary modifications to existing operating systems that drastically overhaul UI interface elements. Because both operating systems have recently developed new user interfaces that have not undergone extensive end-user testing, quite a few rough edges can be observed in the interface elements of both. In 2011 one commentator pointed out that Unity was unusable because of the number of bugs and system crashes. (Bort) Since more current (2013) versions appear to be much more stable, freezes, bugs, and system crashes are ignored for the purposes of this study. This paper focuses exclusively on the experiences of a relatively new user to both of these operating systems and observations made when trying to achieve a few goal oriented tasks. Performance and other technical capabilities and comparisons of both operating systems are also ignored, and the focus is entirely on UI issues such as responsiveness, visibility, affordances, consistency, color schemes, etc. Both operating systems have a significant number of UI faults, and although Windows Metro appears to accumulate a larger number of observed UI violations (likely because Unity has been available to the public for over a year longer than Metro has) Ubuntu

Unity commits the more serious violation of failing to be responsive to the user in many situations. (Wallen)

Overview:

Despite the large number of possible activities that a user may perform utilizing the operating system alone, only a few procedures were analyzed for this paper. Each task shows quite a number of different UI issues all within each goal oriented task. These tasks are broken down for either Unity or Metro and then described in detail.

Table 1: Operating System Activities

PRINTERS	Installing a new printer on the system
STORE	Installing a new application from a software store
UPDATES	Checking for and installing new operating system updates
FINDAPP	Finding an application using the command-line interface
SCREENRES	Changing the screen resolution of the computer

Testing Methodology:

With the exception of installing a printer driver on Ubuntu Unity, all of these activities are performed on a relatively fast 8-core computer with solid-state storage devices. Using a high-end system masks any technical slowness in the interface. Videos of all of these procedures are available embedded in the PowerPoint file for this project and are often referred to directly. Observations highlight both positive and negative observations seen within the steps necessary to perform these goals.

Ubuntu Unity: Adding a Printer

Summary:

Unity during this task displays very poor responsiveness in a number of ways, including providing users no feedback, with no acknowledgment of system busyness or action. The operating system does not provide the user with choices to aid responsiveness, hides affordances, provides no time estimates, creates adaptive menus that move under the mouse with no warning, mixes different types of options in one large unlabeled category, adds to the user's conceptual load, and displays four different colors in one particular dialog box. On the positive side, all actions of the add printer wizard are reversible with cancel, forward, and back options.

Detailed Procedure Analysis:

In order to highlight the responsiveness faults of Unity, this one procedure is performed on a slower EEE-PC Netbook with a 1.5 Ghz dual core Atom processor. At 5 seconds into the video, clicking on the main system affordance produces no noticeable response by the system in any way. No change in the mouse icon or visible animation is seen, so the user has absolutely no idea if the operating system has accepted their input. When clicking on the icon a second time, both clicks are “queued” and the system when ready responds by causing the menu to flash on and off.

At 10 seconds, the menu finally appears and the same lack of responsiveness is seen by clicking on system settings. Again no hourglass is shown and in no way does the system provide any notification that it is currently attempting to load a menu. At 16 seconds when it does

appear, the same lack of responsiveness is seen when clicking on the printer icon. Again another 15 second delay takes place where the system does not indicate that any activity is being processed by the operating system.

At 30 seconds, the printer window appears in the center of the screen and a drop-down menu is shown for a fraction of a second before disappearing. This drop-down menu is relocated to the top left corner of the screen but no animation or visible affordance is provided to the user to show this. The relocated menu is also made invisible at the top left corner of the screen, only by moving the mouse over it will be shown to the user.

At 34 seconds when clicking on the add button, a spinning hourglass is shown for the first time. Unfortunately this animation is shown for maybe only one second and the next window requires a few more seconds to load.

At 40 seconds the “add network printer” dialog highlights a number of UI violations. A single uncategorized menu of 8 items is then shown. Options to manually add a specific type of printer are combined with search options to find a network printer with text “Internet Printing Protocol” displayed 3 times in a row. Finally the system without any indication of activity has been searching for available network printers in the background and when it finds a network printer, the entire menu of 8 options scrolls downward underneath the mouse cursor like an adaptive menu.

Between 40 seconds and 52 seconds, the system is completely unresponsive to clicks on the name of the “found” network printer. Again with no indication of a system busy state, the user is required to wait a full 12 seconds before the system will respond.

At 56 seconds into the video, an empty dialog box is shown to the user and only at 60 seconds does the dialog box contain text displaying that the system is "searching for drivers." Again only for the first 2 seconds of this 30 second procedure is a spinning hourglass shown to the user. The user also has only the option to cancel this search, there is no option to skip searching and go straight to manually selecting a driver. This lack of choice is another failure of responsiveness when compared to other operating systems.

At one minute and 33 seconds, the user is provided a list of printer manufacturers with only a very minimal scrollbar affordance shown on the right side of window. This almost invisible scrollbar does not make it obvious that the user has ability to scroll down to expand this menu. Only by moving the mouse over the right side of the menu is the scrollbar revealed.

At one minute and 48 seconds, a driver selection window is shown and the invisible scrollbar of one menu covers up the text of the second menu. The second menu contains text that is cut off by the edge of the window, but the system notices this and will show you the full text using hovertext when the mouse is moved over the truncated section. As seen at the 2 minute mark, unfortunately this hovertext is also cut off by the edge of the display screen. The operating system does not sense the borders of the display property to keep the hover text completely onscreen at all times.

Windows 8 Metro: Adding a Printer

Summary:

Windows 8 Metro uses very unnatural mouse movements with no affordances (drag to a corner and then drag upward) in order to activate many important Metro operating system

functions. Usability studies state that even on tablets the sliding gestures are difficult to remember. (Nielsen) It violates visibility rules by making the first, second, and third steps of the procedure to add a printer not obvious to the user, allowing an unfamiliar user to possibly fall off the track towards their goal. The system provides wordy and ambiguous error messages in nonfunctional submenus that are not easily reversible, shows inconsistent affordances such as buttons that look like labels, ambiguous menu options, and 2 inconsistent menu options labeled "Devices" which perform different functions based on which menu they are chosen from. On the positive side, the Metro interface shows a very reduced and minimalistic color scheme, is highly responsive at all times using features such as spinning marbles, scrolling marbles, and a smooth progress bar. Metro performs long activities in the background and hides extra procedures from the user if they are not necessary.

Detailed Procedure Analysis:

In order for a user not already familiar with the Windows 8 operating system to add a printer, they must find the mode or menu where the option to add the printer is made available. The first required action is to drag the mouse to either the bottom right corner of the screen and then drag straight upwards, or move the mouse to the top right corner of the screen and then drag straight downward, not a natural action. This displays the Windows "charm bar" with five different options. Clicking on the "devices" provides a wordy error message "nothing can be sent from the desktop" that does not tell the user anything comprehensible. This menu also has no other functionality. Other research studies have shown that this is not an isolated case as many generic functions in the charm bar are sometimes available to certain applications, and users will choose something such as the search option only to be told on a

secondary menu that “This application cannot be searched.” (Nielsen) The operating system should detect that no features under this device menu are available and disable the menu and make it transparent. Also there is no reversal of action. The user is required to exit the charm bar completely and perform the same unnatural drag mouse to corner and then drag upward motion to bring the charm bar up again.

At 14 seconds, the “Settings” option of the charm bar is chosen showing another text menu of five options in one category and six icons in a second lower category. Two of the icon options are semi-faded, with the text normal brightness but the icons semi-transparent. This leaves the user uncertain whether these options are really disabled or not, since ideally both the text and the icon should be made semi-transparent.

At 20 seconds the text options are shown to exit the Metro interface to load traditional Windows desktop functions, an area outside the scope of this paper. Again with no reversal of procedure available, the menu is loaded a third time at 30 seconds and within the category of icons plus text, something that appears to be a text label without an icon “Change PC Settings” is shown to load the Metro interface “PC settings” options. This functionality is unlike the text labels without icons above which load non-Metro interface options. Jakob points out that in statistically analyzed usability tests, users overlooked this button and assumed it was just a label because of the lack of any affordance. (Nielsen)

Within this new menu another label termed “Devices” is shown to have a completely different meaning than the earlier “Devices” option on the charm bar. Clicking on “add a device” at 42 seconds correctly detects that a printer is available. During the search procedure the system shows the user with horizontally scrolling marbles indicating that it is currently

working. When the printer is chosen, another proportional loading bar is shown to the user to indicate that the system is working to find drivers and add the printer to the system. The system maintains excellent responsiveness since this is occurring in the background and the user has full control with no dialog windows blocking their actions.

Ubuntu Unity: Installing Something from the Software Store

Summary:

Unity combines all of the benefits of direct manipulation, hierarchical menus, and a command-line interface in the software store. Text is organized in a hierarchical manner with clean, user-language categories, reversible actions, and icons plus text. The system maintains excellent responsiveness with a progress bar, progress animation, and work performed in the background requires no intervention. Within several windows 3-D shading is used to create categories by placing shadows on the bottom right edges of delineated areas.

Detailed Procedure Analysis:

Unity provides the Ubuntu Software Center as an option on the side program bar that is always available and visible at all times and requires only a single click to load. At 10 seconds the main interface of the store is shown which is somewhat cluttered with quite a few suggestions, control options, category options, and suggested software programs. This clutter is not always a distraction if the goal of loading the software store is somewhat ambiguous. If the user's goal is to simply browse either categories or suggestions to find something to install that they have not thought of yet, such a cluttered interface meets that need nicely. All software programs are shown with a clear hierarchy of text: a label of the category is the darkest

shading, the program name or category slightly lighter, and then the price or description with even a lighter shade of text. With the mix of a category of menus on the left, a command-line search bar at the top right corner, and icons with text labels this menu displays and utilizes the strengths of direct manipulation, menu, and command-line interfaces simultaneously.

At 20 seconds, the user searches for a specific program to install and after a security password, the system shows excellent responsiveness by both installing this program in the background and by showing an animated scrolling pair of arrows displaying that the system is currently working.

As seen at 56 seconds, the software center also provides the user with a list of all software currently installed on the system, updates installed on the system, software removed from the system, and an active history of changes. As seen at one minute the list of software programs is sorted by category.

At one minute and 9 seconds, the background install of Blender finishes and a moving animation on the side of the screen visibly calls attention to the fact that it is now installed and available, and that the operating system added it as a new menu option on the quick launch bar. Finally, at one minute and 17 seconds, it's shown that the user has custom control over the quick launch bar and can either "unlock" to remove or "execute" the program.

Keep in mind that Unity does have other annoying limitations outside the narrow list of issues discussed in this article. For example, only with the latest version of Unity is it possible to easily create desktop shortcuts to programs with a simple dragging motion from the dashboard. Before this, it required a long series of steps including often command-line editing. (Bort)

Windows 8 Metro: Installing Something from the Software Store

Summary:

The Metro interface has very poor visibility. It's obvious to click on store to install a new application, but since the designers did too much reduction, removing both common actions and edge cases, there is no obvious affordance for the common activity of searching for a new application. The search option requires too many motions and clicks to perform, is not goal focused with too many superfluous options such as searching for settings/files, and in neither the start menu nor the store are categories used, producing a lot of clutter. On the positive side, the interface still has excellent responsiveness, when running system oriented functions in the background such as installation, the user is free to do other activities. The system notifies the user with a window that requires no acknowledgment. The colors are also muted and minimalistic. Unlike Ubuntu where just about all applications can now be installed from their software center, many people have pointed out that no traditional Windows desktop applications are available in the Metro store, only metro applications. (Wallen)

Detailed Procedure Analysis:

To get to the Metro store, the user must navigate the start menu interface which is shown as a cluttered mix of metro applications, operating system gadgets, news feeds, and desktop applications. Gestalt similarity in colors could have been used to create associations between tiles in this menu, but unfortunately were not. The purpose for the color choices seems to be nonsensical. News items are orange, purple, red, and green. The store tile, one newsfeed, and the games category is green. Internet Explorer, a weather tile, and Windows

desktop applications are light cyan, the calendar and another newsfeed are dark purple, and finally messaging and maps are a lighter shade of purple.

At 18 seconds, the Metro store is loaded but if the purpose is a goal oriented installation of a specific applications such as Skype, the next step required is not visible. The user is only showed a very minimalistic set of categories with no other useful affordance is for a common activity such as searching for a specific application. A pull-down menu is shown from the top with one nonfunctional button, "home", and another icon that allows removal of previously installed metro applications.

At 55 seconds it is shown that if you want to search for new application, the system requires you to move the mouse to the bottom right, drag upward, click on the search the store, not applications, settings, or files, and then type the name of the application you want to find. The application is installed in the background leaving the user free to perform other actions, and the system notifies the user that the application is installed when it's finished and the new icon appears at the end of the start menu.

Ubuntu Unity: Installing Software Updates

Summary:

Unity fails to be consistent within this procedure. The user has to choose check for updates twice and then choose to install updates twice. It has poor visibility and the location of where to install updates is not immediately obvious. On the other hand, Unity shows excellent responsiveness during this entire procedure in a number of ways, graying out pop-up windows to indicate that a button has been pressed, showing good progress bars that do not get stuck at

0% or 99%, and creating no conceptual load by clearly identifying the activity it is performing at all times.

Detailed Procedure Analysis:

Within the obvious location of system settings there is no icon or other form of option for installing operating system updates. You required to go to the system icon at the top right, click on "about this computer" in order to see the affordance for installing system updates.

Note at 9 seconds the system shows that it's checking for updates and then this message changes to install updates, allowing the user to click on it. This shows good responsiveness unlike the previous printer installation wizard example. When clicking on install updates, the system again shows good responsiveness by showing a progress bar to indicate that it is working on completing the request. The progress bar also does not get stuck at 0%, but shows a quickly sliding animation back and forth before it starts moving, and likewise does not get stuck at 100% either.

At 14 seconds, the options fail to be consistent by showing the same choice "install updates" that the user previously clicked on. After clicking on install updates for a second time, the system proceeds to check for updates a second time as well and after 30 seconds the user must click install updates for yet a third time. Unity has replaced jargon for what it's trying to do with plain language, but went too far with oversimplification by reusing the same two phrases. At 36 seconds the system again shows good responsiveness by graying out the window to indicate that the user has clicked on a button and that the system is trying to respond. Finally Unity shows a progress bar and installs the updates without any further prompts or problems.

Windows 8 Metro: Installing Software Updates

Summary:

Windows Metro again hides this feature under approximately twice as many steps as are required for installing updates with the traditional Windows desktop interface. The "change PC settings" window has its own invisible scrollbar that is not shown until the user moves the mouse over the area. Inconsistent button affordances such as placing a clearly defined gray option box next to a cyan text statement which actually is another affordance, all beneath cyan labels which are not affordances. During this procedure the system shows excellent responsiveness by always indicating its progress and performing work in the background

Detailed Procedure Analysis:

In order to install Windows updates, the user has two different choices of where to go: either the conventional Windows desktop location of control panel, updates, or under the charm bar, settings, change PC settings, and then Windows updates.

Note that 8 seconds into the video the option for Windows Updates is half hidden by the bottom of the screen and there is no scrollbar affordance available to show that the user can choose additional hidden options by scrolling. When the Windows update dialog appears, there is a large gray button type affordance titled "check for updates now" but this will not install updates. The menus in this screen have cyan titles, and a cyan label badly named "we'll download 42 important updates automatically" with no box to indicate that it is an affordance. This cyan "label" is actually the correct choice to tell the system to start installing updates.

At 26 seconds, Metro starts installing updates and shows excellent responsiveness by doing this in the background and providing a progress bar. Note that unlike the Windows desktop update which shows you that the system is working on installing system updates by providing a new icon in the Windows tray next to the clock, Metro system updates show no indication that the system is working in the background if you navigate away from this screen.

Ubuntu Unity: Finding Applications

Summary:

Unity mixes the strengths of direct manipulation, menus, and command-line interfaces in a unified, modeless, expandable interface that can be called with either a single click or a button on the keyboard.

Detailed Procedure Analysis:

To use the command-line based “find application dashboard”, the user can either click on the Windows key on the keyboard or click on the dashboard icon at the top left corner of program bar. Here the user is presented with a searching ability of a command line, mixed icons and text of a direct manipulation system, and a list of choices with an option to expand the number of choices like a menu interface. The system is very responsive and as the user is typing, the system starts auto completing and guessing at the possible programs that user may want to run. Once seeing their program they may simply stop typing and then click on the icon to execute it. The interface modelessly shows recently executed applications and files (if nothing is typed) and searches simultaneously applications, files and folders actively as the user types, and optionally system settings or even software store choices if the options are not

found locally in the computer. This integration of Web services deep into the desktop is one of the key features Ubuntu Unity is promoting. (Wallen) Icons with text labels are used, and the interface itself is semi transparent which minimizes conceptual load. When Unity first appeared on Ubuntu a year ago, the usage of Ubuntu dropped drastically in favor of other versions of Linux primarily attributed to bugginess and unfinished UI. (Wallen) If all of Ubuntu Unity's features become as optimized as the dashboard, it should do a very good job of attracting both these users and quite a few Windows users back.

Windows 8 Metro: Finding Applications

Summary:

Windows uses either the shortcut key or requires the user to click on a nonexistent affordance at the bottom left corner of the screen to load the Metro start menu. The user again has no affordance if they want to type the name of the program they want to run other than to start typing blindly on the screen. Searching is done with modes - only programs are shown unless the user changes the mode to control panel settings or searching for files, searching the store, etc. Metro and Windows desktop icons are mixed in proximity to each other and only differentiated by a slight difference in color. Everything on the desktop is completely hidden while the Metro interface is on-screen.

Detailed Procedure Analysis:

The Metro start menu interface can either be found by clicking on a nonexistent affordance at the bottom left corner of the screen, and instead of providing of text box interface, the user simply needs to start typing without any affordance indicating that he or she

is allowed to. The system is very responsive. As the user is typing letters, the system auto completes and guesses at the name of the program that they want to run. As seen only a few seconds into the video, the system is somewhat ambiguous, Metro and classic Windows desktop icons are not categorized in any way and are shown in the same result window, with only color differentiating between the two. A slightly lighter shade of cyan indicates a Metro-native program and a slightly darker shade indicates a Windows desktop program. Everything is hidden when the user loads the start menu. Unlike either previous version of Windows or Ubuntu, no task bar showing the running programs or any list of the programs currently running is displayed in any way. Usability studies have also that when multiple applications are running, the lack of any taskbar allowing multiple programs to be shown as running on the same screen increases conceptual load and increases the number of errors. (Nielsen)

Ubuntu Unity: Changing Screen Resolution

Summary:

Unity has good visibility: System Settings/Display/Select Resolution changes the monitor screen resolution. It uses simple user language, "Does the display look okay?" to make sure that the new screen setting is supported by the monitor. The interface does not take into account very low resolutions and creates extra problems for the user by having critical affordances slide off the edge of the display when the screen resolution is set very low.

Detailed Procedure Analysis:

With Ubuntu Unity, there is no simple right click on desktop, change resolution. The system has good visibility and places the display settings for the screen in an obvious place

under system settings as seen 15 seconds into the video. If the screen resolution is changed to a very low setting, such as 800x600, the interface creates additional problems for the user by positioning the window so the apply button runs off the edge of the screen. At 36 seconds into the video, it is shown that it is possible to change the screen resolution back to a higher setting as long as you are aware of the functionality of the mostly hidden apply button.

Windows 8 Metro: Changing Screen Resolution

Summary:

Windows 8 Metro has inconsistent affordances that indicate if something is disabled. In some places the text is made semi transparent, in other places the labels are changed to the word unavailable. Certain features are only available in Windows Metro, other features are only available in the traditional Windows desktop interface, and many features are duplicated between both interfaces.

Detailed Procedure Analysis:

In order to change the screen resolution, it would be easier to go into the Windows desktop mode and use a simple right click, change screen resolution, but our study is restricting itself to Metro, the video of this procedure demonstrates an inability to find any controls that change the screen resolution. At 5 seconds into the video, nothing is seen on the start menu when sliding back and forth on the horizontal scrollbar. At 20 seconds into the video, nothing is listed on the charm bar other than a screen settings button that is not semi-transparent but instead has its name changed to "unavailable." This is inconsistent since on the same screen

above another option is shown in regular text but made semi-transparent to show that it is not available.

Conclusion:

Windows 8 Metro although being generally worse in terms of UI features when compared to Ubuntu Unity at least always follows the necessity of maintaining responsiveness to the user at all times. With responsiveness being the most critical element of any successful user interface, Windows 8 with its hybrid Metro/Desktop should please those looking for an operating system that feels and acts as if it is always communicating important information to the user, even if they become frustrated with specific UI elements. Ubuntu Unity is simply too frustrating to a former Windows user with its lack of responsiveness when used for everyday activities. Many sources have recently criticized Windows 8 for utilizing a hybrid interface saying that working in two environments is too inconsistent for users to handle. (Nielsen) The rise of smartphones and tablets with some individuals switching from a Windows environment at work, a Mac environment on their home PC, an iOS tablet such as the iPad, and an android smartphone without difficulty should allow people to put this concern to rest, but as this paper highlights, many UI improvements could easily be done. With its hybrid interface, those familiar with the previous Windows 7 experience may simply use the new operating system with no conceptual load utilizing only traditional Windows desktop elements with an elaborate new start menu.

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