Mirza Misbah Mubeen Baig 2571567
Shahzain Mehboob 2571564
Anton Hag 2575432

41P

Human-Computer Interaction
Exercise sheet 3

Exercise 1 - Ten golden rules of interface design 11

1 **Solution:** Application used for this task is Apache OpenOffice Writer 4.1.6 for windows 10 nice formatting

Golden rules:

1. ***Keep the interface simple:***

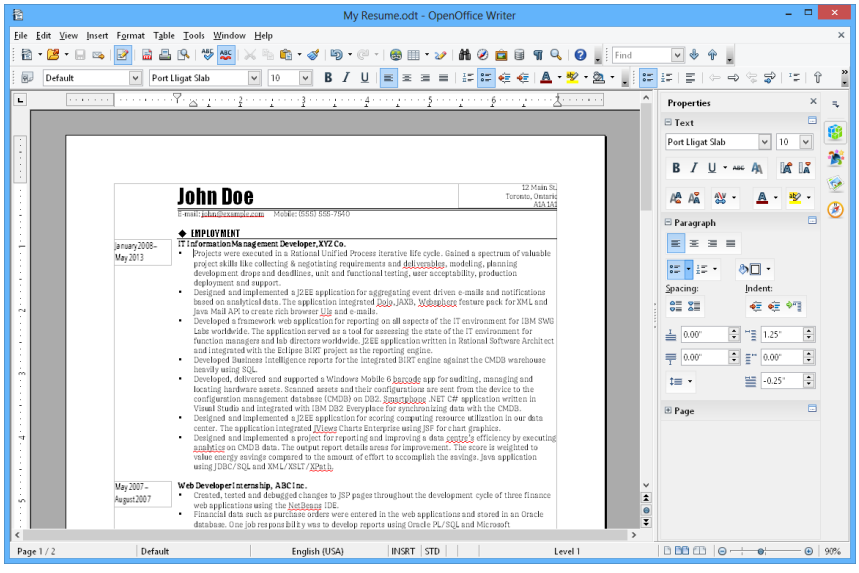
1 Apache OpenOffice provide simple interface to users. This application fulfills “Keep the interface simple” rule. Use of any icon or accessing an item location is very convenient as compared to Apache OpenOffice interface.

2. ***Speak the user’s language:***

1 This application provides the interface which clearly speaks user’s language and follows this rule. As all of the terminologies used to perform an action are widely understandable to the user.

3. ***Be consistent and predictable:***

1 Apache OpenOffice Writer has consistent command design for the user. For example, Open file or CTRL + O command both shows a similar situation for open an existing file.



4. ***Make things visible and provide feedback:***

1 This OpenOffice follows the visibility and feedback rule. Main menu provides drop-down list as a feedback and possibility for next action. For example, when user perform the wrong action the sound beep that acknowledge user that you are trying to perform invalid operation. Moreover, Tool-bar provides tool-tip when user hover on the icon.

5. ***Minimize the user's memory load:***

1 Apache OpenOffice reduce user's memory load. For example, when inserting text into the word processor, it gives multiple option to user if user insert wrong text.

6. ***Design for error:***

1 Apache OpenOffice follows this rules. It provides the way to avoid errors such as mistyping and grammar mistakes by highlighting the region of error.

7. ***Design clear exits and closed dialogs:***

1 Apache OpenOffice violates this rules, as it does not clearly state the Back, Quit or Cancel options to the user.

8. ***Include help and documentation:***

1 Apache OpenOffice also violate this rule, as it does not include online as well as offline help option for the user with documentations.

9. ***Offer shortcuts for experts:***

1 Apache OpenOffice offers relatively insufficient shortcuts for general purpose and advance tasks for experts as compared to other application.

10. ***Make the system responsive:***

1 This application violates rule of system responsiveness. Whenever system goes dead, Apache OpenOffice usually goes unresponsive and makes system inaccessible to the user.

Exercise 2 – Direct Manipulation Paradigm 12

Application: Analysis of Microsoft office 360 PowerPoint for windows
The 3 main principles of Direct Manipulation Paradigm are:

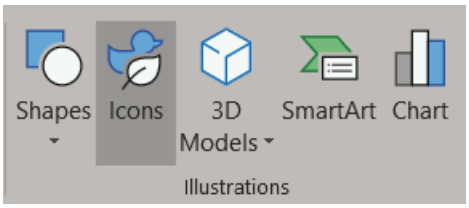
1. Continuous representations of the objects and actions of interest with meaningful visual metaphors.
2. Physical actions or pressing buttons, instead of complex syntax.
3. Rapid, incremental, reversible actions whose effects on the objects of interest are visible immediately.

Solution part (1)

Implementation of the 3 main principles of direct manipulation

3

a. One example of continuous representation of actions of interest are the icons under illustrations subgroup. All buttons have a small icon each, which follows the same design pattern with pastel colors and a flat design. They also look like the thing they insert, for instance the "Chart" button has an icon which looks like a bar graph and the 3D models button have an icon of a box drawn in 3D perspective.



b. The same tab "Insert" can be used to show how buttons are used instead of complex text syntax. To insert a shape, one presses the Shapes button, chooses a desired shape, and can then directly with the mouse draw that shape on the presentation preview. There is no need to for instance specify the coordinates of the shapes.

c. As said, it is easy to insert a shape on a desired position since the only actions needed are to select the right shape tool in the menu and then draw the shape directly on the layout preview. The system is rapid and incremental, since it's easy to draw objects, the WYSIWYG principle makes most effects visible immediately and all actions are reversible using the undo function.

Solution part (2)

Violations against the 3 main principles of direct manipulation.

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a) All tabs in the program (such as Home, Insert, Design and so on) opens their own sub menu when chosen (blue area in figure), except the File tab, which opens a full window view that hides both all other tabs and functions and the presentation workspace area. This is not consistent with all other tabs.

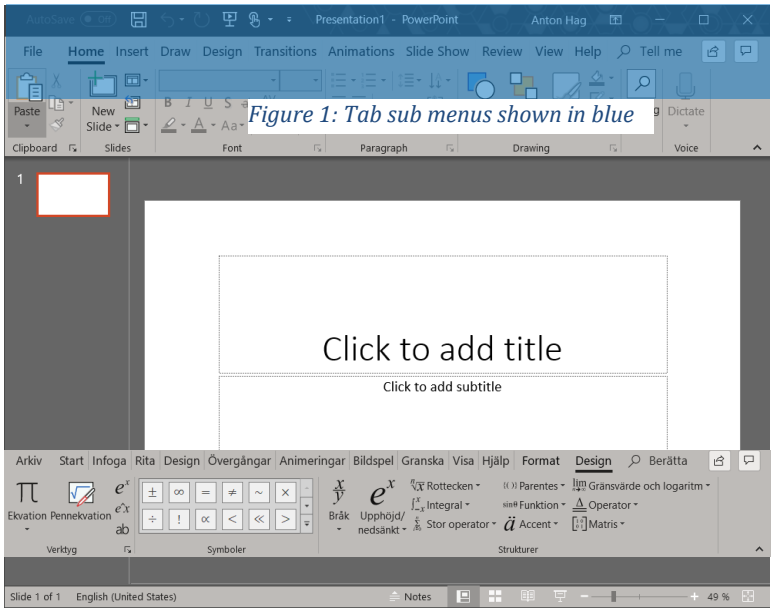

Figure 1: Tab sub menus shown in blue

b) If one wants to include an equation in a presentation, the program opens the Equation Design tab where the user can choose between many commonly used symbols or structures such

Figure 2: Equation design tab

as writing fractions, indices or exponents. Since many equations uses very many of these functions, the user even for short equations is required to go to the tab and choose the desired command. This takes very long, especially if it's a long or complex equation with functions in other functions, and for instance the LaTeX syntax is much more efficient once the user has learned it. It's also easy to make small mistakes such as adding an extra white space in an exponent without noticing.

c) PowerPoint is a linear structure; we have to advance from slide to slide in a predetermined sequence. Whereas, Prezi is non-linear. It is structured in a three-dimensional canvas. You can present it in any order that suits your situation. With this kind of structure, you can adapt to the needs of your audience spontaneously, instead of sticking to your scripted sequence.

6 **Solution part (3)**

Commands that are well suited to be used with speech commands are changing slides and insert text symbols, and commands that are bad suited for speech commands are layout designing of the presentation or creating tables.

- If the presenter simply could say "next" to change slides, they could focus much more at the presentation and the public and remove the need of a remote controller or standing close to the computer when changing slides.
- Inserting text symbols into the presentation would be suitable since the current symbol insert window just lists all symbols and it's hard to find the desired, and if one simply could say the name of the desired symbol and it appeared it would save a lot of time for people who frequently uses different symbols, like when writing math equations.
- Designing the layout of the presentation would not be well suited for speech control, since it would be very hard to specify exactly where on the slide different elements should be placed only using voice.
- Creating tables would also be bad suited for speech control since data tables often require a lot of data in different cells and with different design of headers, rows, spacing and so on which would be hard to specify only using voice.

3P Exercise 3 - Desktop interface

-1P, "limit yourselves to 6 sentences max)

Solution: The design involves a simple concentric layout of buttons with the play/ pause button at the center of the screen that comes up and disappears on mouse hover. The forward, full screen and backward buttons are at the bottom-center of the screen respectively. Previous and next buttons are arranged at the the bottom-left corner and bottom – right corner respectively. In addition to that, sound bar and brightness bars are given at the corners specifically for video player only. The layout will not be fixed to a position on the screen but will rather be centered at location at which the mouse is moved. This makes it easier to access the frequently used play /pause button right away without having to move across the screen, and is also easier for the user to recognize. The other buttons can be easily accessed quickly on moving the mouse radially outward from the center and the distance is less with the size of the icons being sufficiently large. This design is based on Fitts' law, the principle of Spacing grouping-simplicity, and additionally, immediate feedback of results of an action (like clicking play/pause, the track name display changes). 3

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References:

Windows 10 Background image was taken from our own laptop's screen using snipping tool.

Video Player interface designed using online tool Gliffy, background used in the video player is taken from windows images.

Exercise 4 – Zoom-able User Interfaces

Solution: The four applications used for this task are Google Maps, Prezi and Adobe Light Room. The purpose for choosing these application is only because these are one of the most frequent and popular zoom-able interface among users.

Google Maps: Google Maps provides the feature for the users to zoom in and out from specific regions on a map. It uses zooming to accentuate the features like real-time traffic, providing directions, places, satellite mode, etc.

Advantages

1. Google Maps shows a wider area of the place in the default view that lets user see and explore a larger area. However, when zoomed in, Google maps provides in-depth locations, streets, real-time traffic etc. of the place and its surrounding areas that the user is interested in.
2. The maps ensure that not all names pop-up when the user is viewing the maps in the default view, and instead only the prominent areas are labelled. This ensures that correct mapping is done and prevents overcrowding and cluttering of the screen. As and when the user zooms, further details are displayed.

Disadvantages

1. When a user wants to see two places but are in the zoomed in view (to may be view the direction between them), the user has to consistently zoom out and zoom in again to get an overview of the two places and the path.
2. With the ability to zoom in (and additionally see things in 3D), It somehow poses a security and privacy risks to the users as people can see details unhindered without any limitations and any verification.

Improvements

1. Google Maps provide a feature like PIP (Picture in Picture) that provides the second location in a smaller image next to the zoomed in image so that the user can maintain an overall perspective of the region.
2. Google Maps may prevent privacy and security concerns by blurring the images or preventing the detailed image rendering in critical and sensitive areas.

Prezi: Prezi uses zooming interfaces to create interactive and interesting presentations. Initially all slides are displayed in a single screen and then the active slide is centered and zoomed in, while clicking anywhere else resets the view to the default zoomed-out view.

Advantages

1. On the default view, Prezi presents an overview of all slides which is a map like structure that's very interactive to users and lets them pick what to see without having to explore everything else
2. The site provides visible feedback to user – when a slide is clicked, it zooms in with an animation and brings in only the relevant content to the user.

Disadvantages

1. The site provides slightly poor affordance – navigation across slides isn't very obvious, and for a new user it might be confusing as to how to go to next slide or to reset to the original view
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2. The slide can be difficult to use in scenarios when the viewers ask questions like go to previous slide, or if the presenter wants to show something specific – instead he/she will have to go through the entire animation again. Also, in such cases, saving, printing and annotating such presentations is very challenging

Improvements

1. Providing on-screen navigation buttons that lets the users know what is next, what can be clicked or how to go to original view can greatly help the users interact better
1
2. Providing ability to directly go to slide numbers and providing an additional familiar structured layout to users (like at the bottom of each slide) can help them take notes or prints which can then help in academic or official settings

Adobe Lightroom: Adobe Lightroom uses the zooming interface to help users edit, update and add effects to users.
4
1 The zooming feature is extremely important for users to edit pictures in extreme detail and add effects at desired regions of an image, so as to ensure a higher quality final image.

Advantages

1. The ability to zoom in to the images lets the user figure out what part of the image needs to be edited and altered, making it convenient for the designer to work on
1
2. The application brings familiar controls from its counterpart (Photoshop) and some other editing applications that lets users scroll (and use other shortcuts) to zoom, pan, center – thus making it convenient to use for seasoned users

Disadvantages

1. The application design may not seem fully consistent for a new user – scrolling on the image zooms the image while scrolling on the image selection pane below it changes the selected image – which can be confusing for the user.
1
2. The app is designed for professionals (and semi-professional) users and thus lacks affordances for the new user. It is not obvious how to zoom, pan, or reset the zoom when an image is selected

Improvements

1. The application should have consistent behavior of controls when on the same screen, and maybe instead use other shortcuts (like Ctrl key) on other panes. Otherwise an option should be provided to set the
1 preferences for a new user.
2. A set of symbols that make it obvious on how to control would greatly help a new user in trying to understand the application behavior.

Exercise 5 –Interfaces 3

Solution part (1)

Command-based interface is interfaces where the user inputs text commands to the system via a command line and the system responds, can ask questions and guide the user through tasks. Two advantages are that the user easy can execute complex and precise commands and that they get a history over most recent executed commands. Two disadvantages are that the user most often needs to be able to recall the commands and the commands' syntax they want to execute (possibilities for recognition are limited) and that the commands are pre-written and follows a certain algorithm, there is no way to deviate from the prewritten path of execution.

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Solution part (2)

Speech-based interfaces are interfaces that are using speech as input and output methods, which means that the user uses theirs voice to execute commands and the system responds with spoken sentences. Advantages of speech-based interfaces are that language is one of the most natural way for conscious communication between humans and therefore it's easy to understand and use even by novice users. It also allows for use, but still let the user do other things that requires vision and motion control, like driving. Disadvantages can be that since the user must speak to use it, people in the surroundings can easily be disturbed if it's quiet. The interface also requires the users to have their own separate room with good sound proofing if they handle sensitive data, and it's therefore a bad choice for use in open office spaces or in public.

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