

Interaction Styles

For screen-based interfaces



Interfaces can support one or more of the following **interaction styles**:

1. Direct manipulation
2. Navigation and menu selection
3. Form fill-in
4. Command language
5. Speech interface

Direct Manipulation

- With direct manipulation users interact directly with the items they are interested in.
- This is the closest to the natural way we interact with the world.



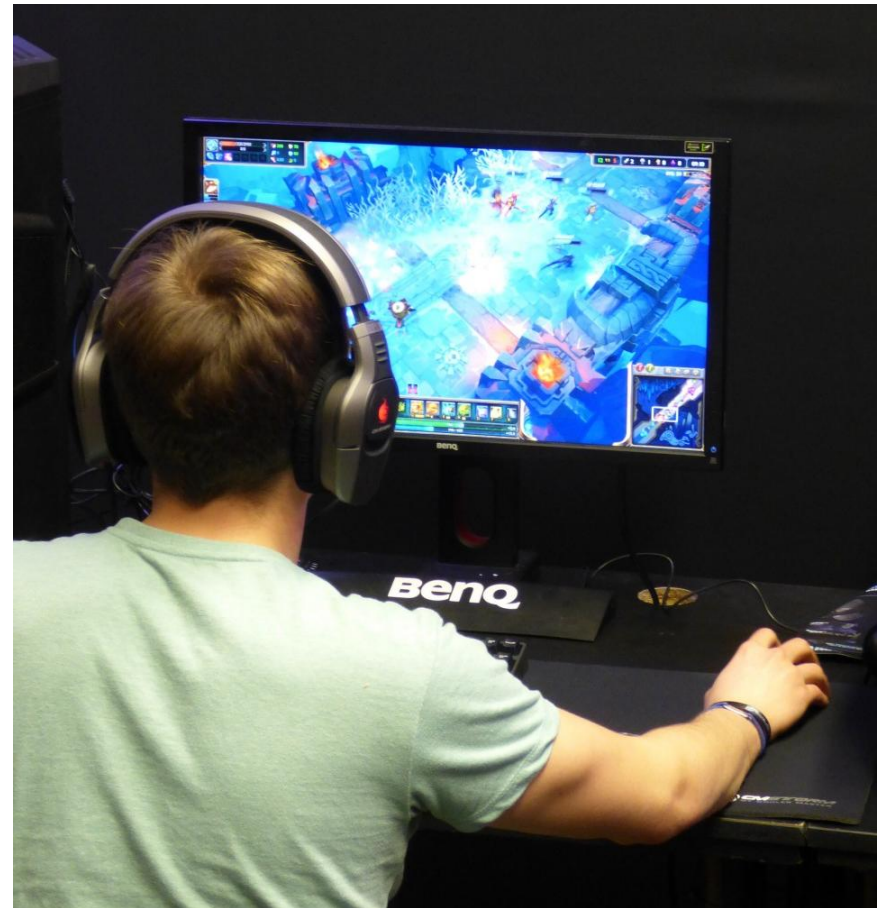
Direct Manipulation

- Coined by [Ben Shneiderman](#) in the early 1980s as a mode of interaction in which:
- Objects of interest are continuously visible.
- Users interact with physical actions.
- Operations are rapid, incremental and reversible.
- Users get immediate and continuous feedback from their actions.



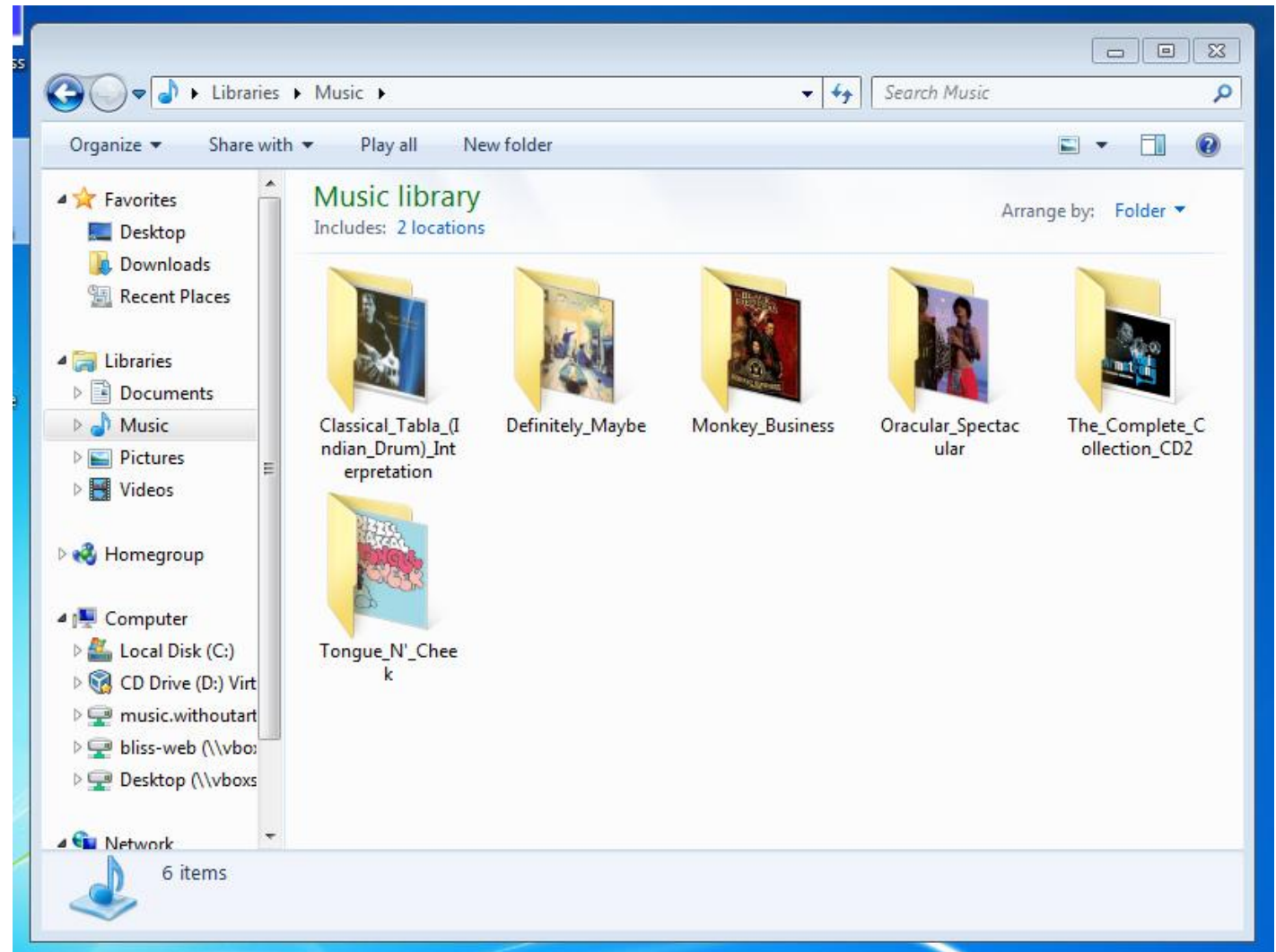
Direct Manipulation Example

Computer and
mobile games



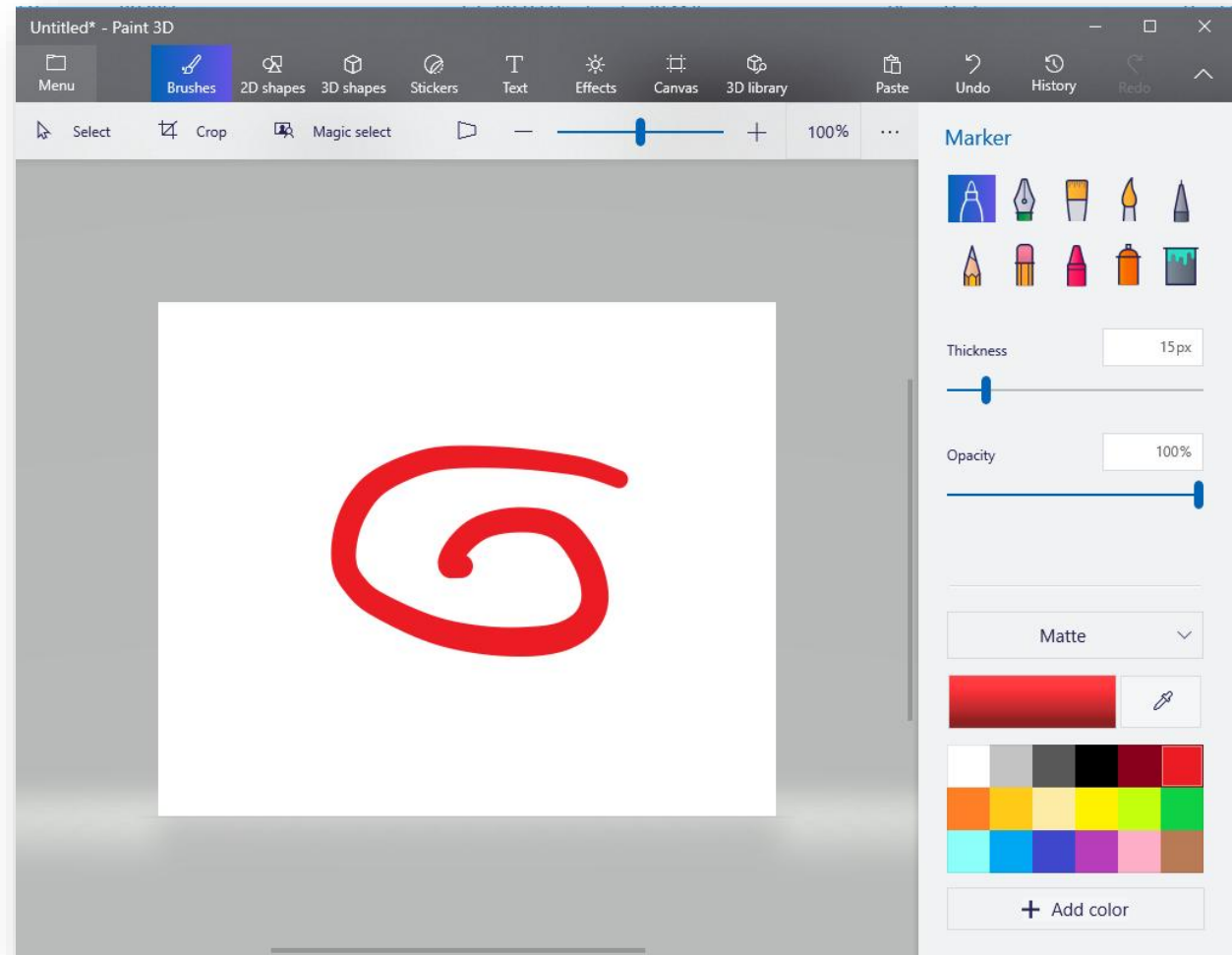
Direct Manipulation Example

Desktop interface



Direct Manipulation Example

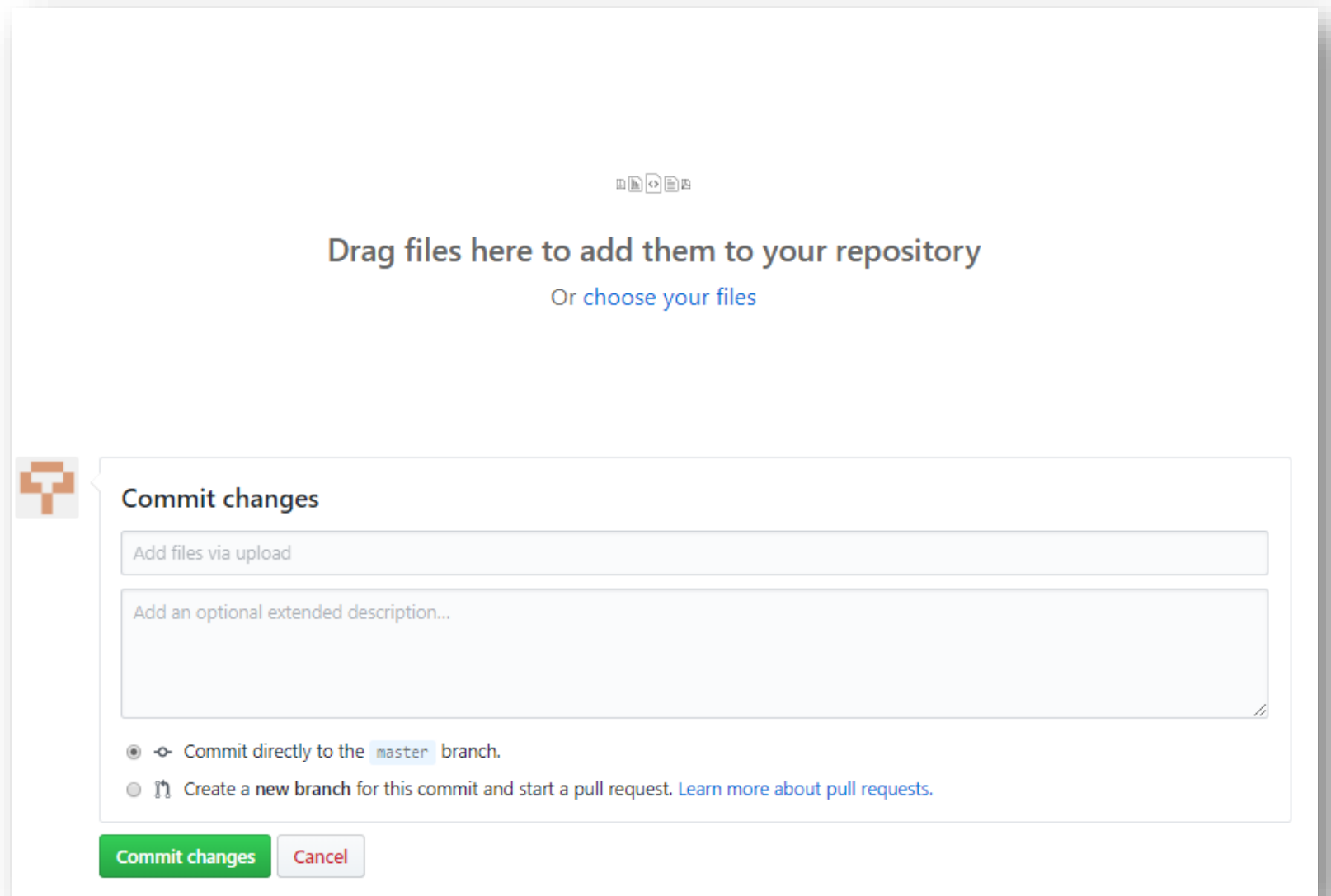
Paint application



Source: Paint 3D


Direct Manipulation Example

Drag-n-drop
file upload



The screenshot displays a GitHub commit interface. At the top, there is a drag-and-drop area with the text "Drag files here to add them to your repository" and a link "Or choose your files". Below this is a "Commit changes" form. The form includes a text input field for "Add files via upload", a larger text area for "Add an optional extended description...", and two radio button options for commit strategy. The first option is "Commit directly to the master branch" (selected), and the second is "Create a new branch for this commit and start a pull request". At the bottom of the form are two buttons: "Commit changes" (green) and "Cancel" (grey).

Drag files here to add them to your repository
Or [choose your files](#)

 **Commit changes**

Add files via upload

Add an optional extended description...

Commit directly to the `master` branch.

Create a new branch for this commit and start a pull request. [Learn more about pull requests.](#)

Commit changes Cancel

Direct Manipulation Example

Virtual Reality



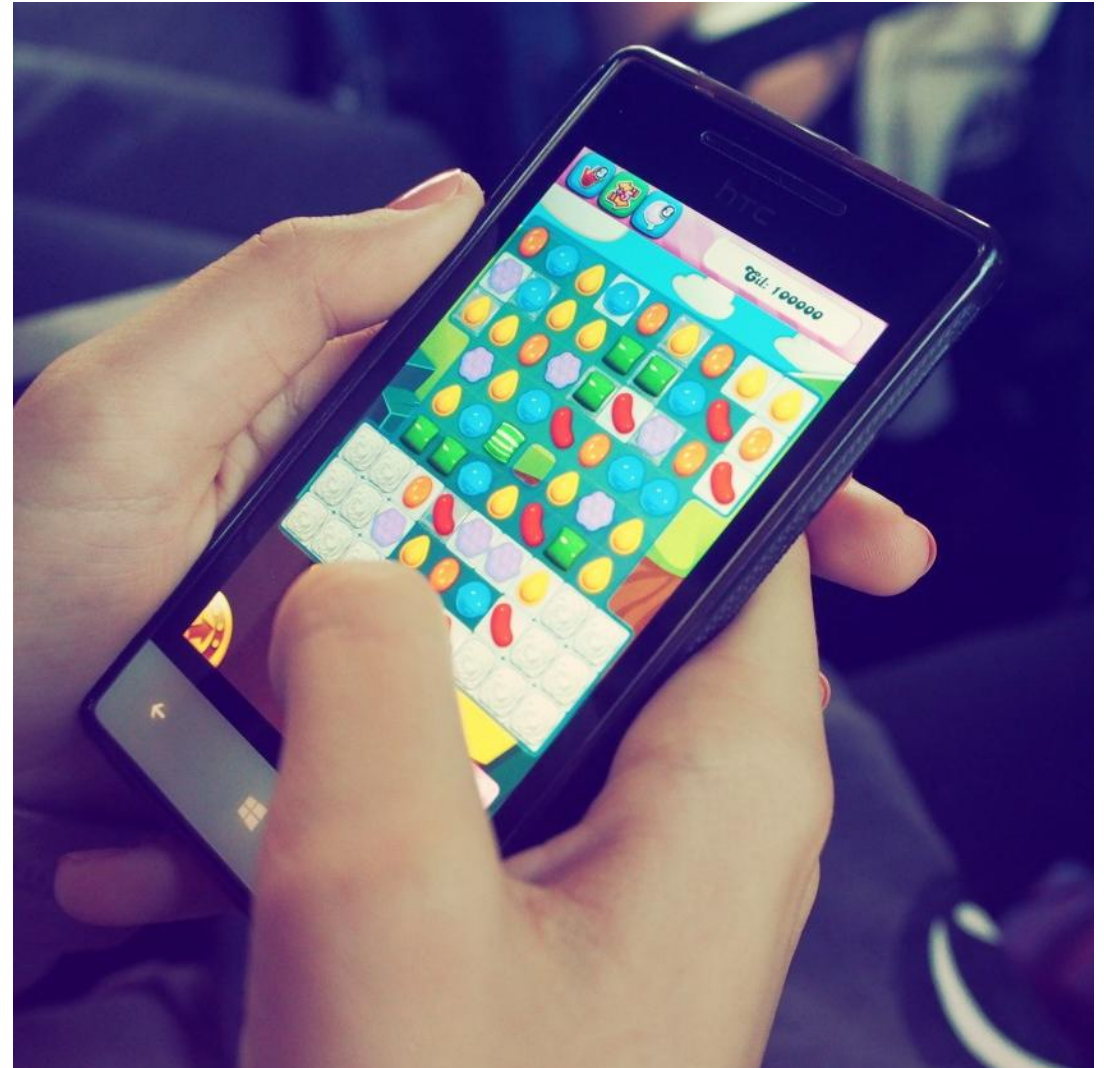
Direct Manipulation

Advantages

- Easy to learn how to use
- Encourages exploration
- Users make less errors
- Fun!

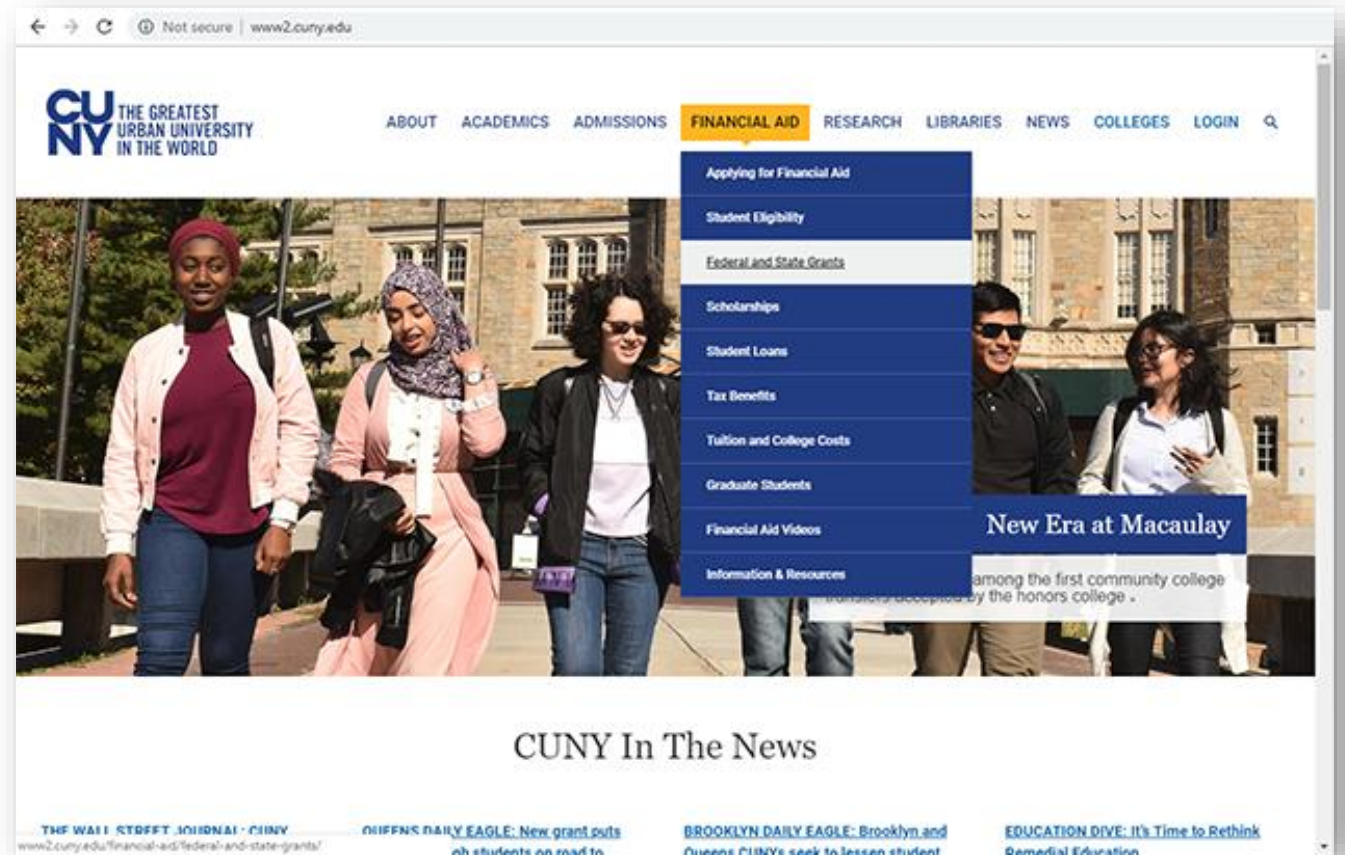
Disadvantages

- Development requires advanced programming skills
- Design for accessibility may be challenging



Navigation and Menu Selection

- Menus present users with a list of choices.
- Menu labels must be clear and distinct for users to make the right choice.
- In interfaces that use menus content and functionalities are organized in groups and categories.



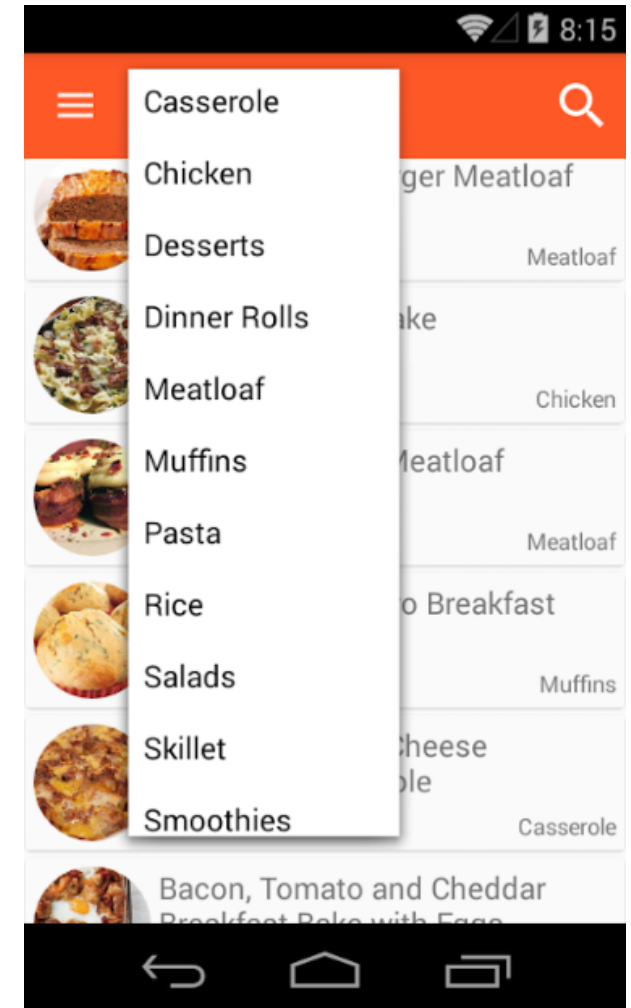
Navigation and Menu Selection

Advantages

- Little learning or memorization is needed when labels are clear and distinct.
- Familiar navigation controls are easy to use.
- Provides structure to content.

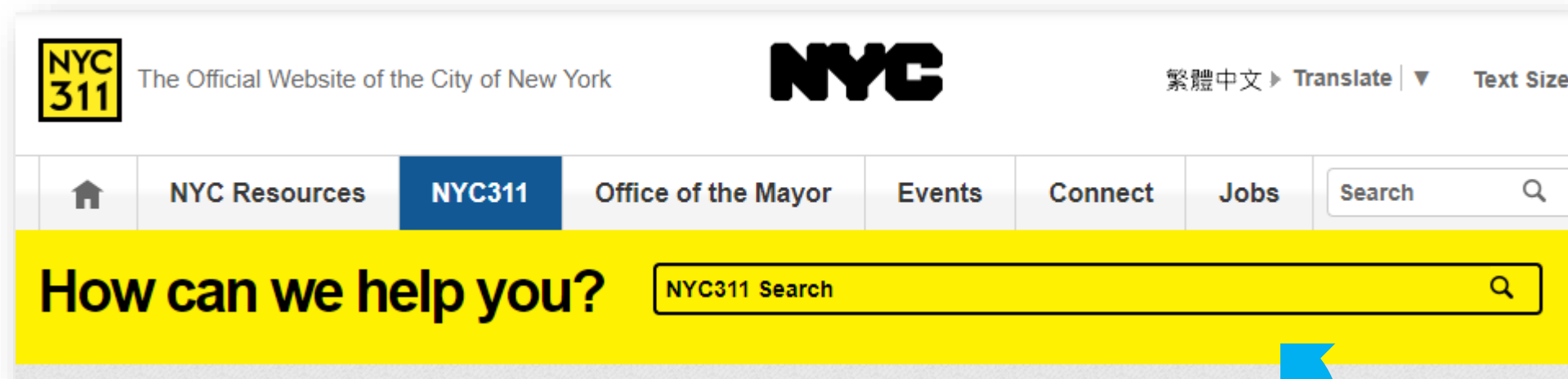
Disadvantages

- Many menus can clutter the screen, overwhelm users and require mental effort to sort out.
- Menus take screen real estate away from valuable content.



Form Fill-in

- Forms are used when users need to input data, such as their contact information or a message.
- Some users prefer to navigate by using a search form. In the page below from nyc.gov, users can search the 311 archive.



The screenshot shows the top navigation bar of the NYC 311 website. On the left is the NYC 311 logo and the text "The Official Website of the City of New York". In the center is the "NYC" logo. On the right are links for "繁體中文" (Traditional Chinese), "Translate", and "Text Size". Below this is a horizontal menu with items: Home, NYC Resources, NYC311 (highlighted), Office of the Mayor, Events, Connect, and Jobs. To the right of the menu is a search box with a magnifying glass icon. Below the menu is a large yellow banner with the text "How can we help you?" on the left and a search box labeled "NYC311 Search" with a magnifying glass icon on the right. Two blue arrows point to the search boxes: one to the top-right search box and one to the bottom-right search box.

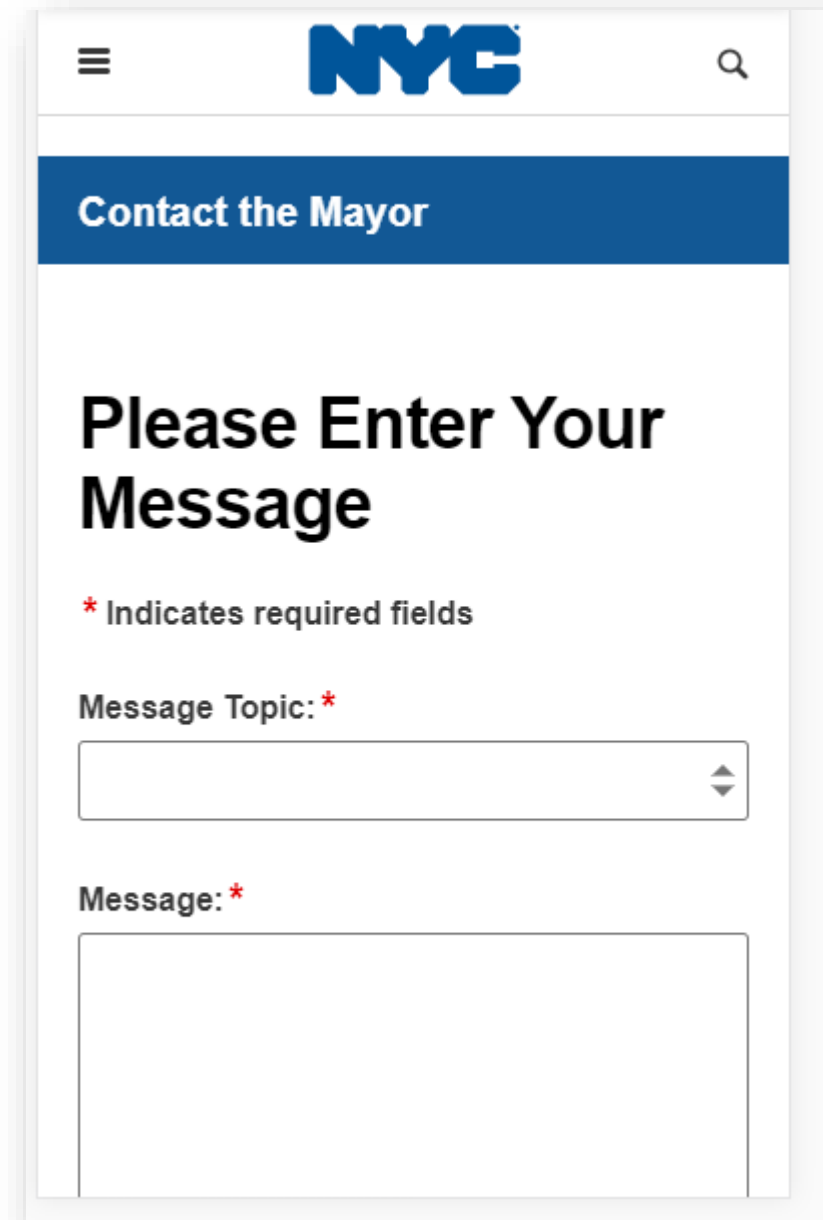
Form Fill-in

Advantages

- Forms are the most efficient way to enter data.
- Searching can provide quick access to specific content.

Disadvantages

- Requires concentration and mental effort from users



The screenshot shows a mobile web interface for contacting the Mayor of New York City. At the top, there is a navigation bar with the NYC logo and a search icon. Below this is a blue header with the text 'Contact the Mayor'. The main content area features the heading 'Please Enter Your Message'. A legend indicates that an asterisk (*) denotes required fields. The form consists of two main sections: 'Message Topic: *' with a dropdown menu, and 'Message: *' with a large text input area.

Command Language

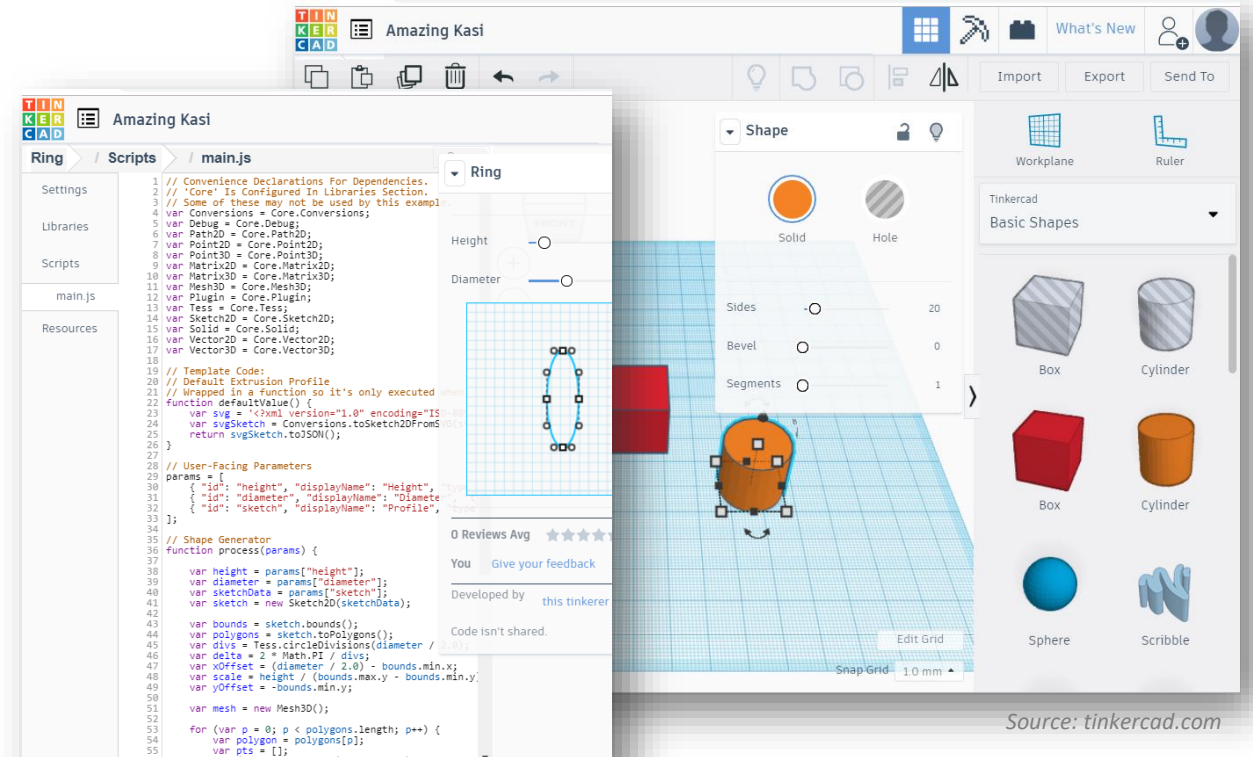
- Before Windows arrived, PCs' operating system was Microsoft's MS-DOS.
- DOS was a command-line operating system. You had to know the commands to type to launch programs, manage files and do anything with your computer.

```
Starting MS-DOS...  
  
HIMEM is testing extended memory...done.  
  
C:\>C:\DOS\SMARTDRV.EXE /X  
C:\>_
```

- Read more about [PCs Before Windows: What Using MS-DOS Was Actually Like](#)

Command Language

- A command language interface allows users to complete tasks by typing commands, using a dedicated syntax or a programming language.
- Command language interfaces are for frequent users and/or power users with knowledge of computing.
- [Tinkercad](#) is an online application that has an easy-to-use Graphical User Interface to create 3D models. It also allows knowledgeable users to build more complex models with JavaScript code.



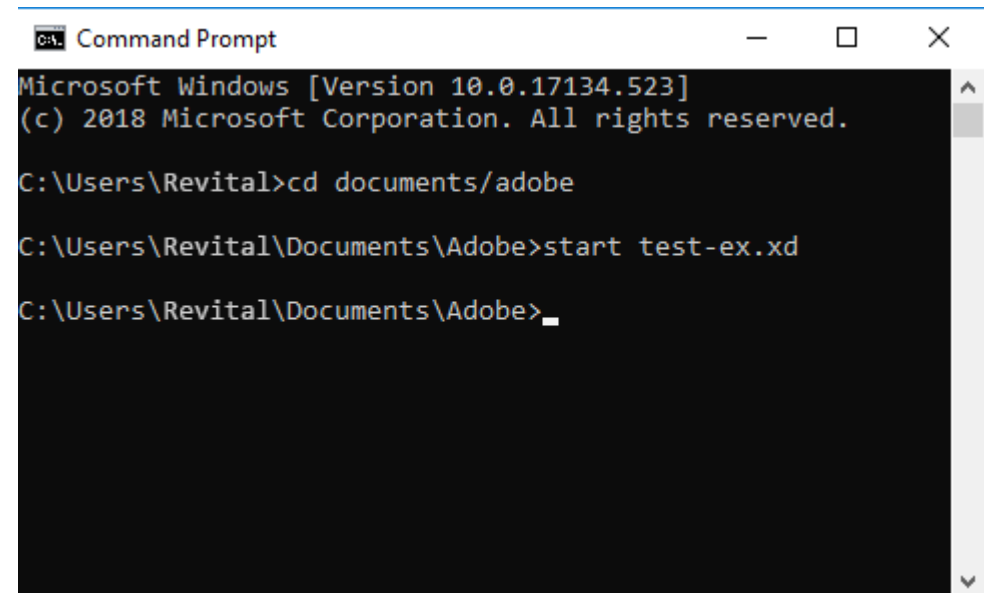
Command Language

Advantages

- Can offer advanced features not possible to accomplish otherwise
- Can shorten the time needed to complete tasks

Disadvantages

- Requires high levels of computer literacy
- Steep learning curve
- Error-prone



```
Command Prompt
Microsoft Windows [Version 10.0.17134.523]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Revital>cd documents/adobe
C:\Users\Revital\Documents\Adobe>start test-ex.xd
C:\Users\Revital\Documents\Adobe>_
```

Natural Language

- Increasingly, user interfaces respond properly to spoken or typed natural-language statements

Advantages:

- No need to learn an interface or syntax

Disadvantages:

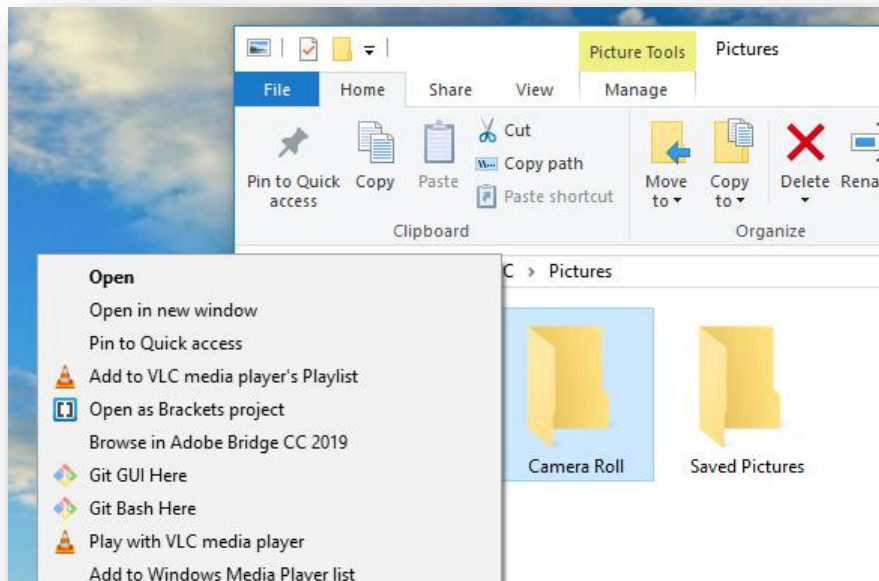
- Unpredictable
- May requires clarification dialog or extra typing



CC Image by [iphonedigital](#)

Blending Several Interaction Styles

- Several interaction styles are often used to support a range of tasks and users with varied skills.
- For example, a checkout interface can include forms and menus.
- A desktop allows direct manipulation but a right-click brings a popup menu.

A screenshot of a "SELECT PAYMENT METHOD" form. At the top, there are two radio buttons: "Credit Card" (selected) and "Pay Pal". Below this are three main input fields: "Name on Card" (a text input), "Type" (a dropdown menu with "Visa" selected and a list of options including "Visa", "American Express", "Master Card", and "Discover" visible), and "Number" (a text input with an example "4111111111111111" below it). There are also two dropdown menus for "Expiration Date" (Month and Year) and a "Security Code" text input. At the bottom of the form is a large black button labeled "REVIEW ORDER".

Source: aeropostale.com

Vocabulary

- Interaction styles
- Direct manipulation
- Interface
- Navigation
- Menu
- Menu labels
- Form
- Speech interface
- Command Language
- Virtual Reality

Content in this slideshow is based on chapter three of *Designing the User Interface: Strategies for Effective Human-Computer Interaction, 6th Edition* by Ben Shneiderman, et al.

To learn more about interaction styles read:
<https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/interaction-styles>