

Graphical interaction (part 2)

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3 levels of graphical interaction

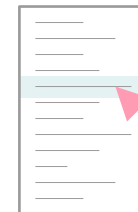
Basic actions

“alphabet” of graphical interaction



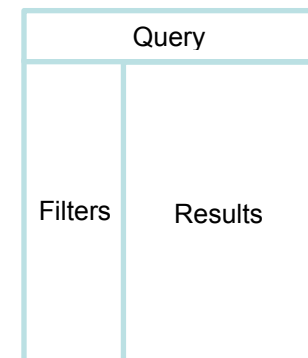
Basic interaction tasks

“vocabulary” of graphical interaction



Interaction patterns

“syntax” of graphical interaction



Interaction patterns

Combinations of basic interaction tasks

Complex data input

Selection

Dialog box

Inspector

Tool palette

Complex data input

Text with format

Phone number

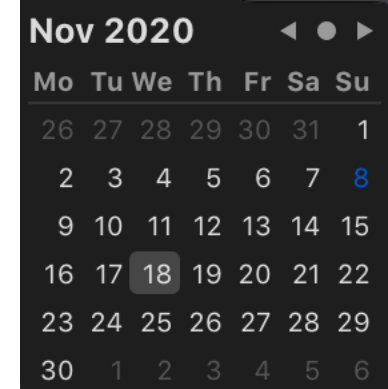
+33 1 69 15 69 10 | accept spurious characters

Credit card number

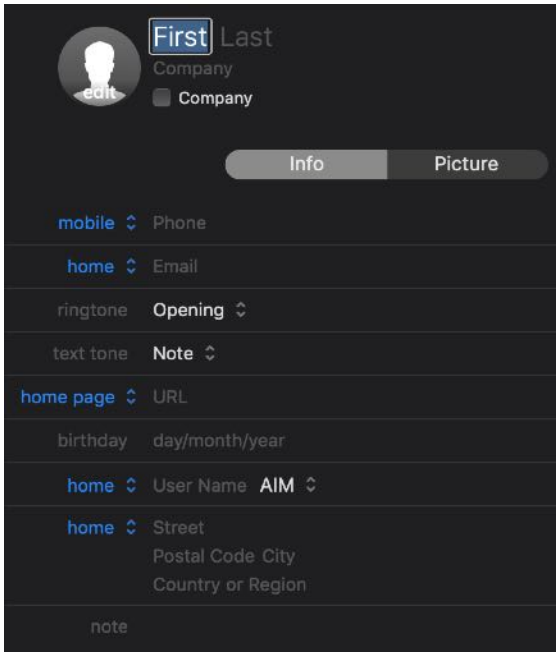
1234 567 |

Date

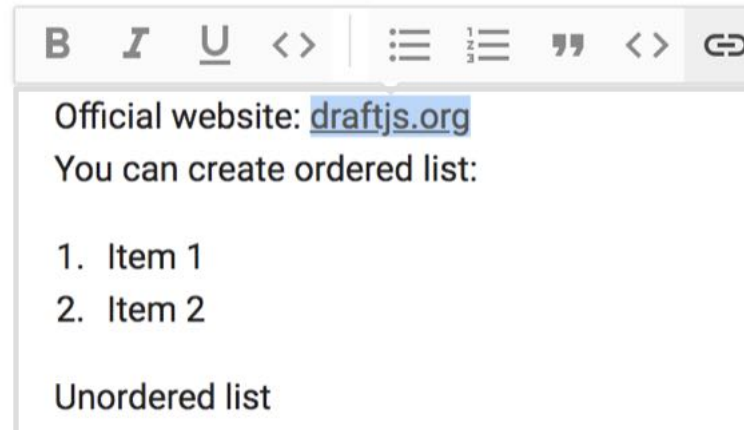
18 ▼ November ▼ 2020 ▼



Form



Rich text



Syntax of graphical interaction

A command requires :

one (or more) object(s) of interest [the **subject**]

an action [the **verb**]

parameters (sometimes) [adjectives]

2 possibilities :

Specify first the object(s) of interest *then* the action

Subject-verb syntax

Better when applying several actions to the same objet

Specify first the action *then* the object(s) of interest

Verb-subject syntax

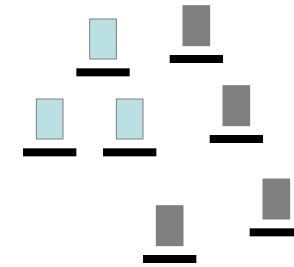
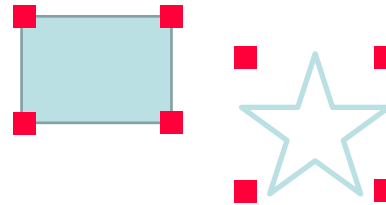
Better when applying the same action to several objets

Subject-verb syntax: the selection

The selection is the object (or set of objects) that the command will be applied to

It is specified by direct designation of the objects, which are highlighted

The selection is specified by direct designation



The action is specified with menus, buttons, drag-and-drop
Invalid actions should be deactivated (greyed-out)

Subject-verb syntax: the selection

Command parameters

The selection is specified
by direct designation

selection

Size ...

action



modal dialog box

Problems :

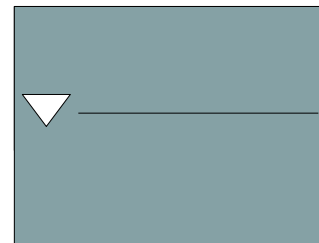
Requires to close the dialog box before seeing the effect

=> "Apply" button

Large number of parameters

=> optional part

=> tabs



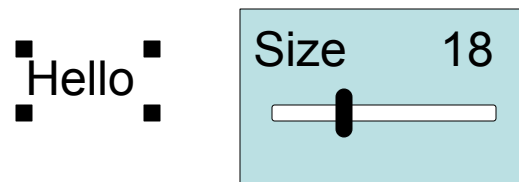
Subject-verb syntax: inspector

Inspector

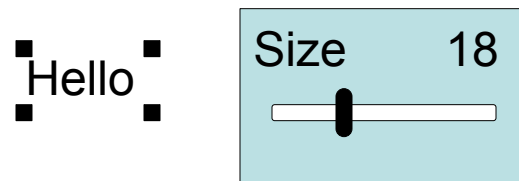
Always visible



Content changes according to the selection



Effects of changes or immediately visible



Subject-verb syntax: inspector

Inspector

Always visible

Hello

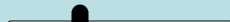
Size



Content changes according to the selection

■ Hello ■

Size 18



Effects of changes or immediately visible

■ Hello ■

Size 24



Subject-verb syntax: inspector

Work area
Selection of the objects of interest

Property
inspector of
selected
objects


Subject-verb syntax: inspector

Subject-verb syntax: the selection

The selection is the object (or set of objects) that the command will be applied to

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The selection is specified by direct designation



The action is specified with menus, buttons, drag-and-drop

Invalid actions should be deactivated (greyed-out)

6

Style
Text
Arrange

Body*
Update

Style
Layout

Font

Arial ⌵

Regular ⌵ 24 pt ⌵

B
I
U
S
⚙

Character Styles None ⌵

Text Color ⌵

≡
≡
≡
≡

←
→

↑
✳
↓

Spacing

Lines ⌵ 1 ⌵

Before Paragraph 25 pt ⌵

After Paragraph 0 pt ⌵

Bullets & Lists None* ⌵

No Bullets ⌵

Indent: 0 cm ⌵ 0 cm ⌵
Bullet Text

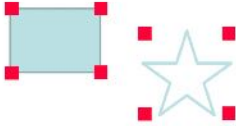
Subject-verb syntax: inspector


Subject-verb syntax: the selection

The selection is the object (or set of objects) that the command will be applied to

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The action is specified with menus, buttons, drag-and-drop

Invalid actions should be deactivated (greyed-out)

6

Style
Text
Arrange

Text

Text

Text

Text

Text

Text

Shape Styles

▼ Fill ▬▬▬

No Fill ▾

▼ Border ▬▬▬

No Border ▾

▼ Shadow ▬▬▬

No Shadow ▾

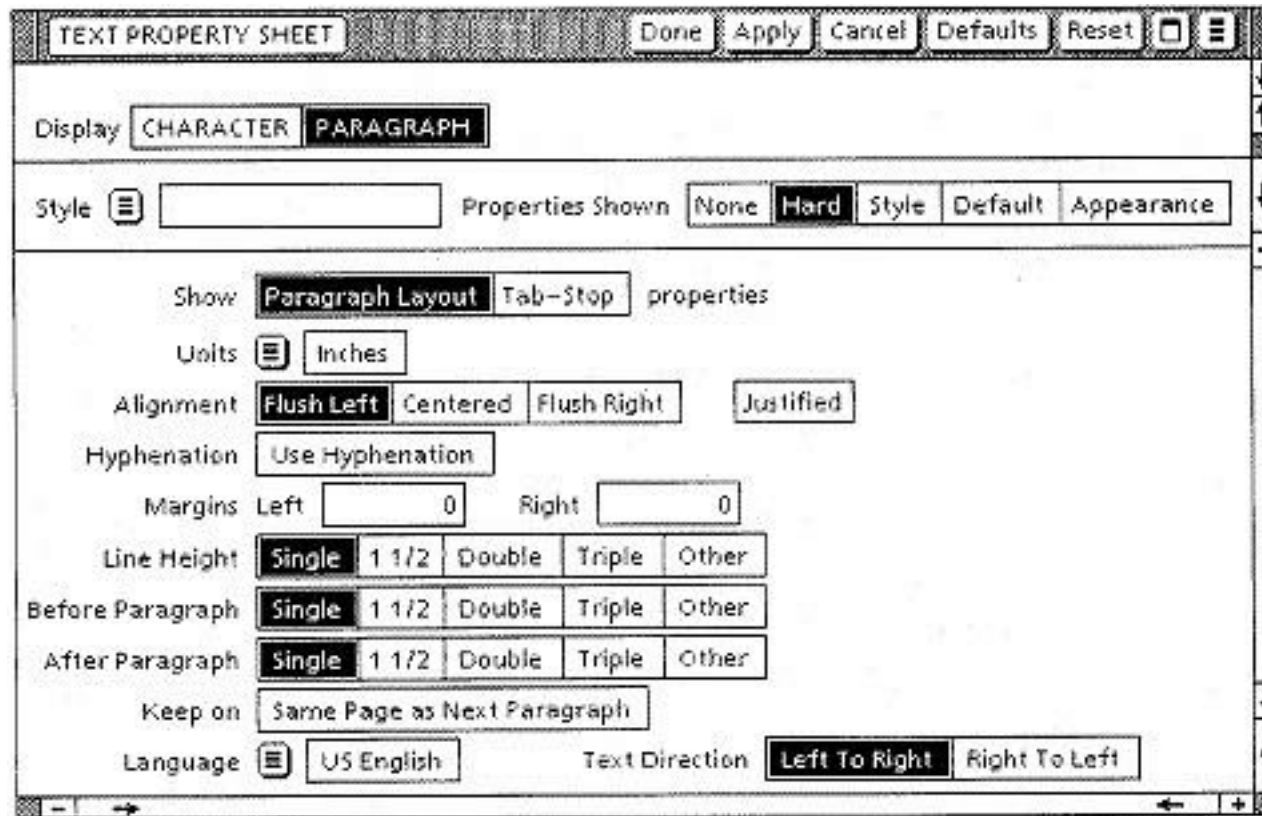
Reflection

Opacity 100 %

Title Top ▾

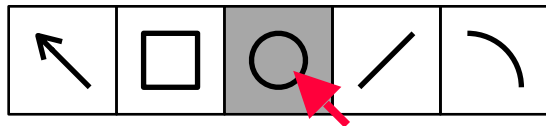
Caption

Property boxes – the Xerox Star (1981)



Verb-subject syntax : tool palette

Select tool in palette



Set tool parameters

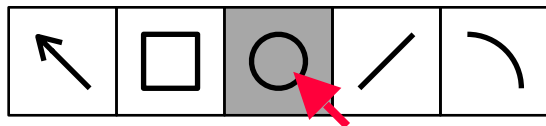


Apply tool to object of interest



Verb-subject syntax : tool palette

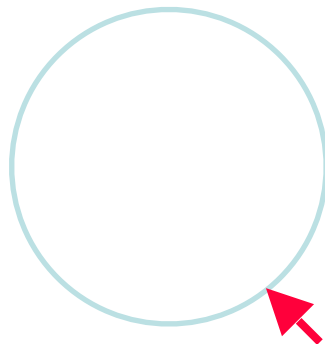
Select tool in palette



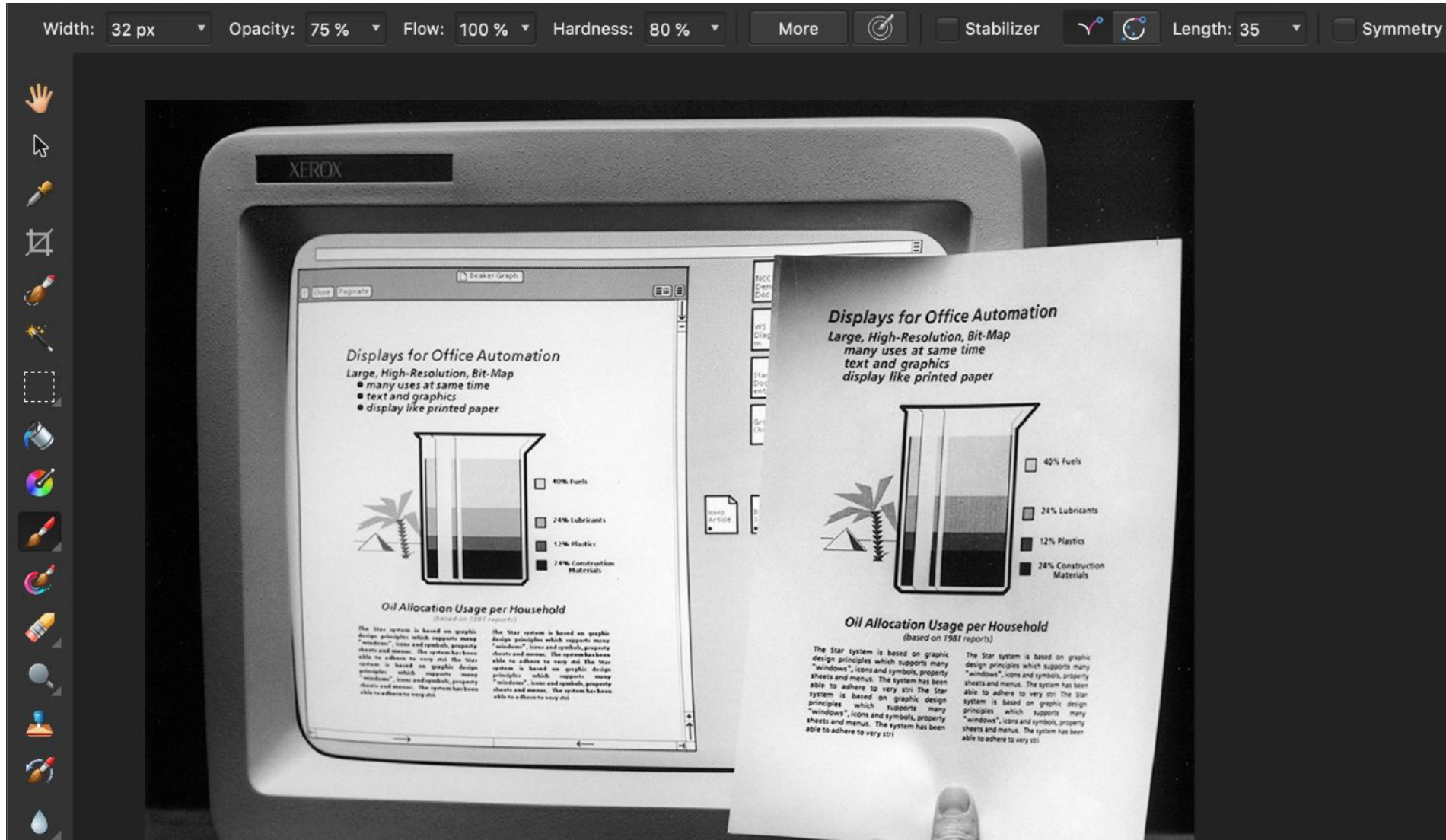
Set tool parameters



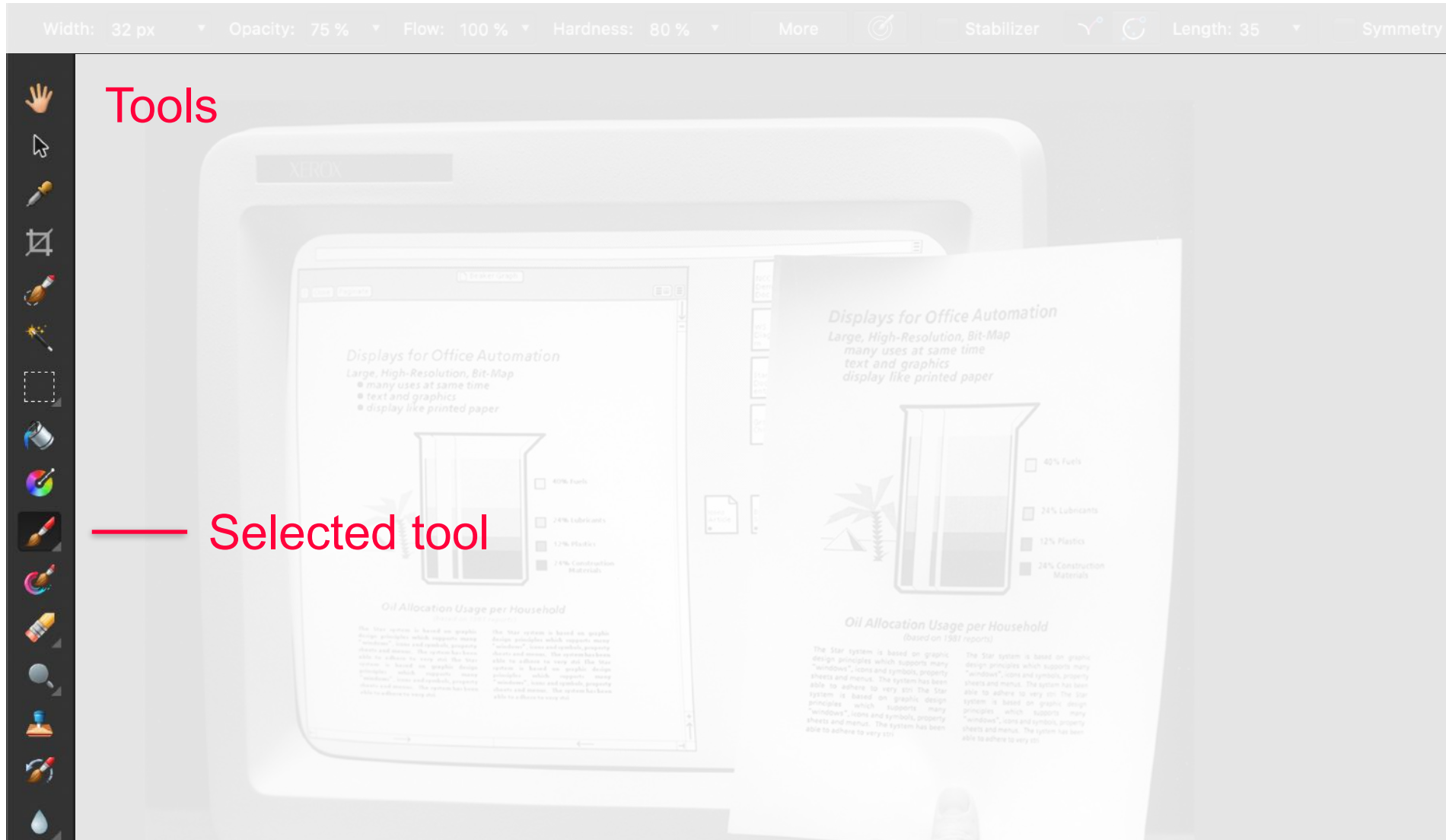
Apply tool to object of interest



Verb-subject syntax : tool palette




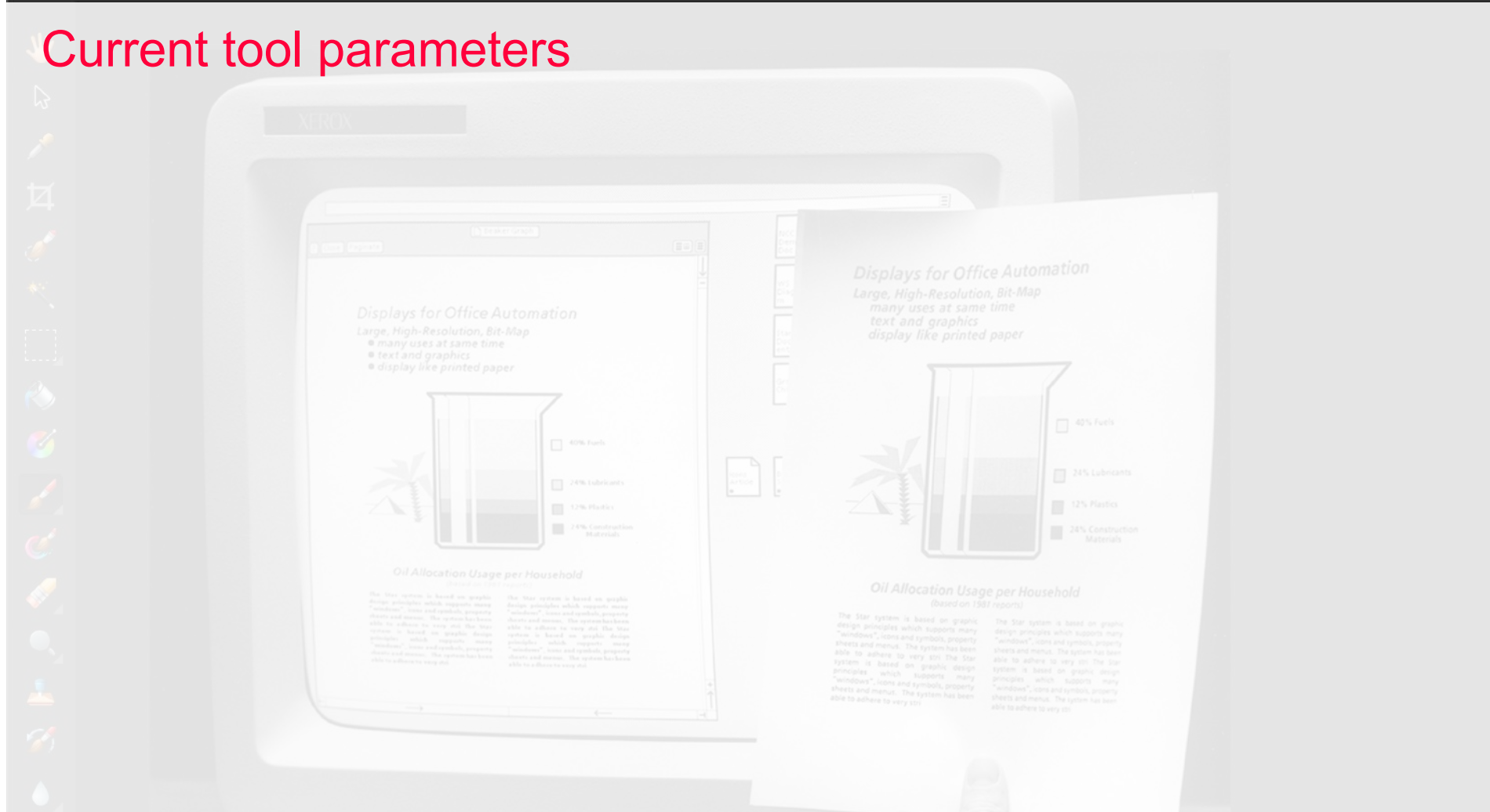
Verb-subject syntax : tool palette



Verb-subject syntax : tool palette

Current tool parameters

Width: 32 px ▾ Opacity: 75 % ▾ Flow: 100 % ▾ Hardness: 80 % ▾ More  Stabilizer   Length: 35 ▾ Symmetry



Modes

Mode = state of the interface where user actions are interpreted consistently, and differently than in other modes

Problems: Mode visibility, mode change

Examples

“vi” text editor:

Type “Esc” to switch between input/command modes

“emacs” text editor:


Control and Meta modifiers to enter commands

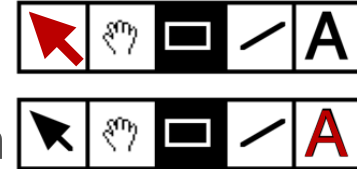
Tool palettes:


Select a tool to activate it

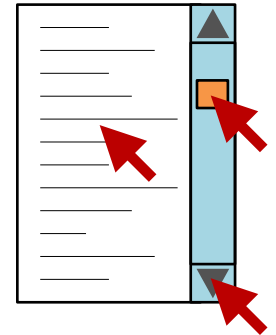


Modes

 **Temporal modes**
 The same user action performed at different times
 has different effects if the user changes mode in between
 Problem: Initiative of the mode change



 **Spatial modes**
 The same user action performed at different locations
 has different effects



Quasi-modes
 Temporal modes activated as long
 as a physical action is sustained



An interface is a collection of modes

Conclusion

3 levels of analysis of graphical interaction

Basic actions:

Pointing, Activation, Dragging

Basic interaction tasks:

Input, Selection, Trigger, Navigation,
Property/parameter specification, Transformation

Interaction patterns:

Complex data entry, Subject-Verb vs Verb-Subject,
Selection, Dialog boxes, Inspector, Tool palette

Conclusion

Direct manipulation vs. **Indirect manipulation**

Objects of interest

Menus & Forms

Analyzing interfaces in terms of basic interaction tasks

Select (among existing info.) vs. **Input** (new information)

Recognition

vs.

Recall

Generic methods vs. specific ones

Syntax: **subject-verb** vs. **verb-subject**

Modes organize/structure the interface: **Spatial** vs. **temporal** 

