You are in a meeting, and the conversation sparks an idea you think is worth capturing. Or you are trying out an application, and you see an interaction element in it that is worth remembering. Or you are in a movie theatre watching a movie, and you see a futuristic depiction of computers that you want to consider later. In all cases, you are in the middle of other things, so you only have a few moments to capture these ideas in your sketchbook.

This is where **scribble sketching** comes in. Scribbling is all about drawing very quickly, without much attention to detail, and at very low fidelity. Scribble sketching is the same, with the exception that the scribble focuses on the essence of whatever idea you want to capture, sacrificing all other detail. Scribble sketching is an important skill to acquire, and you can acquire it easily just by doing lots of it. This exercise will get you started.

CAPTURING IDEAS IN EXISTING SYSTEMS

In the following examples, you'll do several time-limited scribble sketches (30 seconds each), where your goal is to capture an essential idea shown in these interfaces.

1 Look at the screen shot below (a view of Microsoft's Explorer window for file browsing). Create a scribble sketch that captures a primary idea (for example, the structural layout of the window) as laid out in this view. Use a watch to limit yourself to 30 seconds.
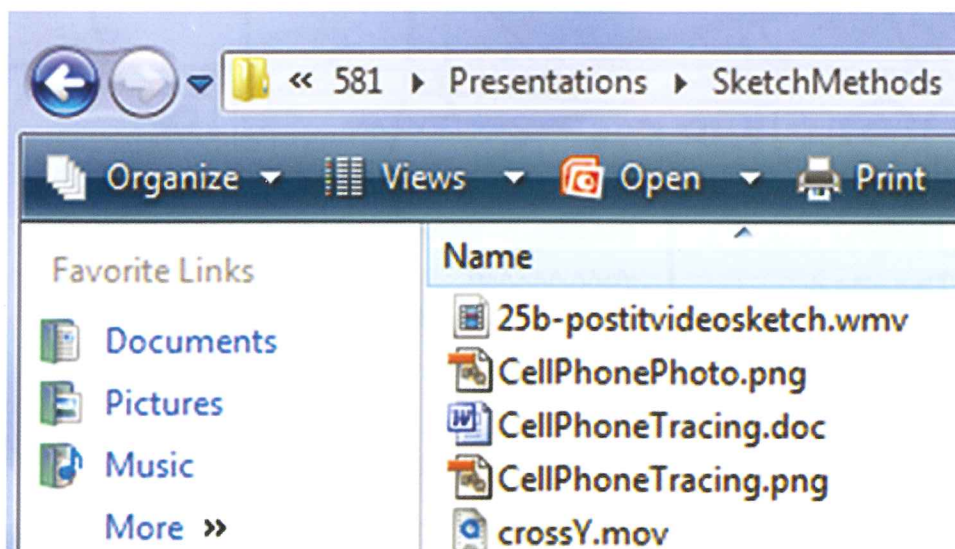
Materials

- pencil
- sketchbook
- a watch that counts in seconds

2 Here is one scribble sketch solution that emphasizes the overall layout into panes and what is in them. Of importance is:


– **What details are included.** Details included highlight the primary concept being captured, in this case, the structure of the panes, and a few key buttons and fields in a stylized form.

– **What is abstracted as a caricature.** Less important aspects are muted somewhat. In this case, the icons and labels (which represent files, folders, and commands) are shown throughout as a box with scribble text.

– **What is left out.** Non-important details are omitted entirely. In this case, all the decorations, actual text and lesser interface controls are excluded. Decorations that make this look good are not included, as are the actual text of the various components.
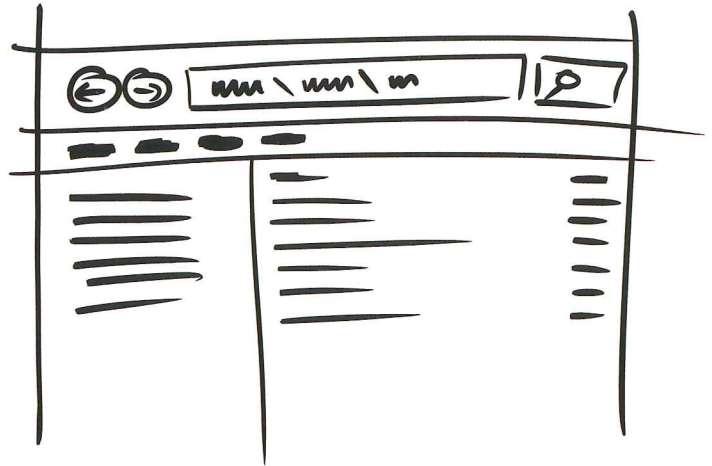
3 Of course, the scribble sketch you create depends totally on what you want to emphasize. Here is another scribble sketch, also done in about 30 seconds. This sketch captures a different idea, in this case the various interaction methods used in the title bar to rapidly navigate to other folders. Note that this sketch also includes a few annotations to explain the scribbles.
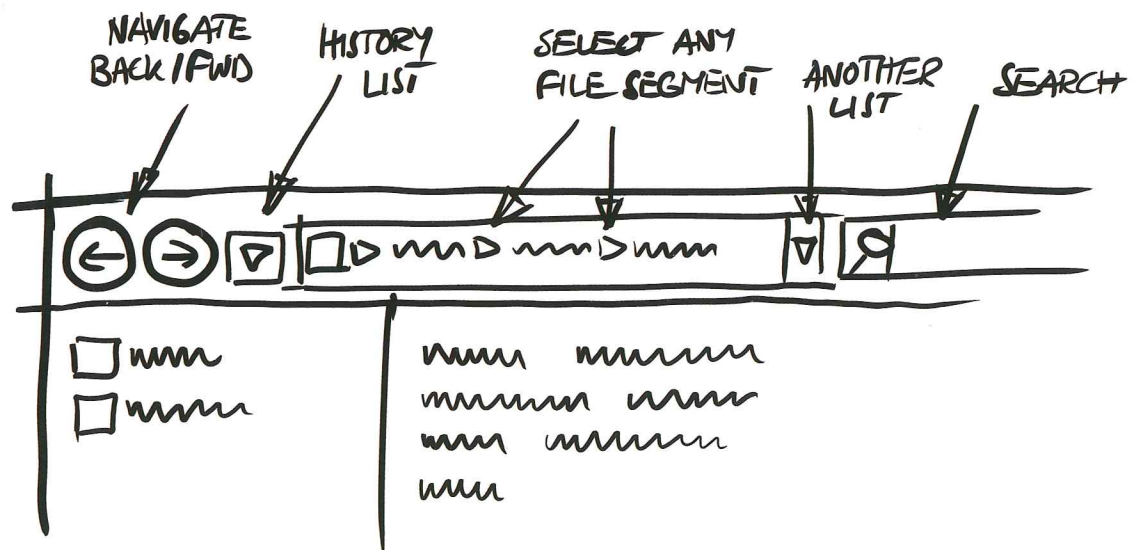
SCRIBBLE SKETCHING IN THE DARK, WHILE DOING OTHER THINGS

The beauty of scribble sketching is that it can be done anywhere, anytime, as long as you have a pencil and something to draw on (preferably a sketchbook so you don't lose it).

Ideas can come from many places, at unusual times. The example below is a scribble sketch I created while watching the movie *Avatar* at the theatre, where it was showing a futuristic control room. The idea that grabbed me was how the monitors were two-sided, i.e., where the image displayed on the screen was visible from its front and back sides. I thought this enhanced screen visibility was an interesting way to provide others with awareness of one's activities, so I scribbled a sketch showing this, as seen below.

I did this while watching the movie, in the dark, without even looking down. I had my first glimpse of the sketch sometime later. Sure, it is crude, and many of the lines are in the wrong spots (although it is surprising how reasonable it turned out). But that didn't matter; the scribble sketch was enough to remind me of the idea: the screen contents visible on both sides, the person using the screen on the left, the walker-by on the right, and both being able to see the screen contents as indicated by the two arrows.

A scribble sketch doesn't have to be beautiful or even meaningful to others. It just needs to capture the idea in a form sufficient to remind the creator (you) of what it is. You can always redraw it later if you want to.
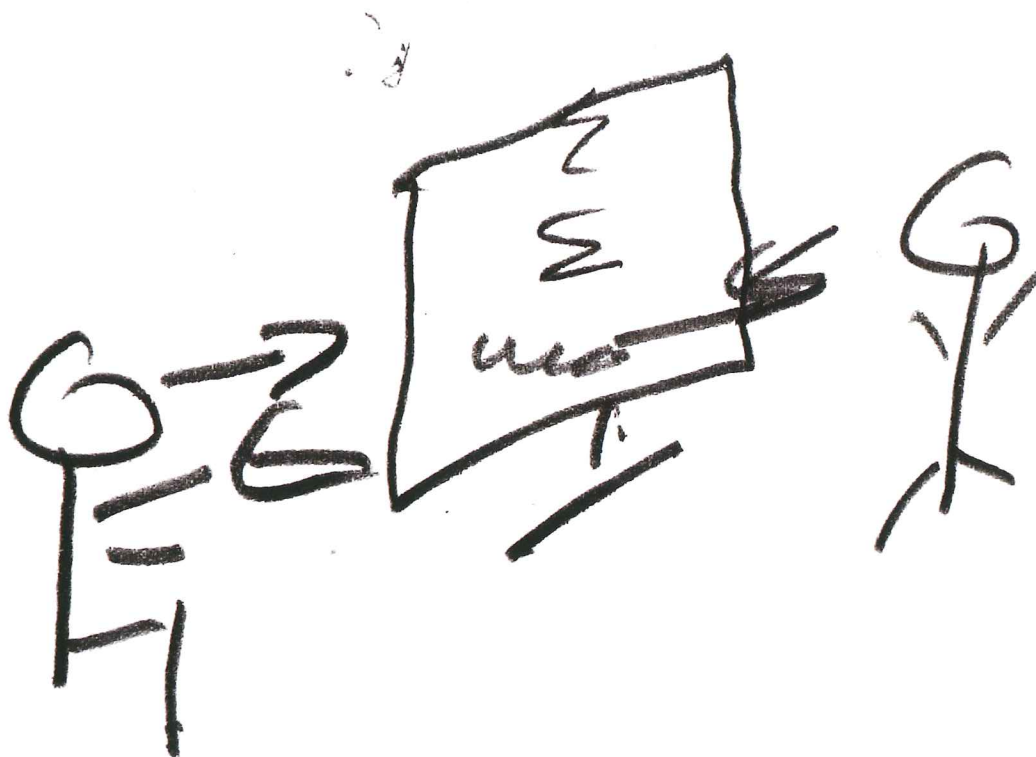
PRACTICING SCRIBBLE SKETCHING

Practice and repetition helps you develop a 'critical eye', where you pull out the essential idea from what you are thinking of or from what you are seeing. Repetition will also help you develop scribble sketching as a habit.

Method 1

Open up an application of your choice on your computer. Giving yourself 30 seconds or less, try to capture the essence of an idea as a scribble sketch. Then repeat this, where you create new scribble sketches that capture different ideas in an application. Now try this again with different – perhaps unfamiliar – applications.

Method 2

Search YouTube or other sites for videos of innovative interfaces. As you are watching them, scribble sketch as many ideas that capture your interest without pausing the video. This will force you to sketch very quickly, i.e., as soon as you see an idea.

Method 3

Redo Method 2, but this time don't look at your drawing while you are sketching. The trick is not to move your hand around that much while scribbling, otherwise your lines will not be in the right place. It takes a bit of practice, but you will be surprised how recognizable things are, at least to you.

YOU NOW KNOW

Scribble sketches:

- are done very rapidly (often in a few seconds),
- serve as a means to capture a critical idea on the fly,
- sacrifice detail and fidelity to speed,
- with practice, can be drawn without looking.
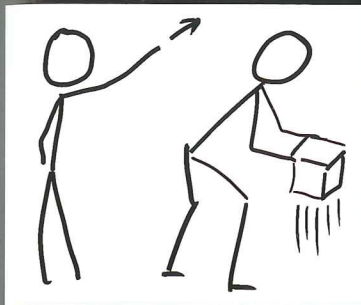
Many of your sketches will contain quite similar things – a **sketching vocabulary** of shapes. This sketching vocabulary serves as the basic elements of most sketches. If you practice creating this vocabulary, you will be able to rapidly compose your sketches. This chapter reviews several elements in the basic sketching vocabulary: objects, people, activities, emotions, and posture.

1 Basic Sketch Elements

Lines, rectangles, triangles, and circles will be essential visual elements of many of your sketches. Sketching and drawing tutorials often begin with 'warming up' exercises of filling a page with a random collection of these basic shapes. Become familiar with this variety of shapes. Play with line thickness and hatching styles.
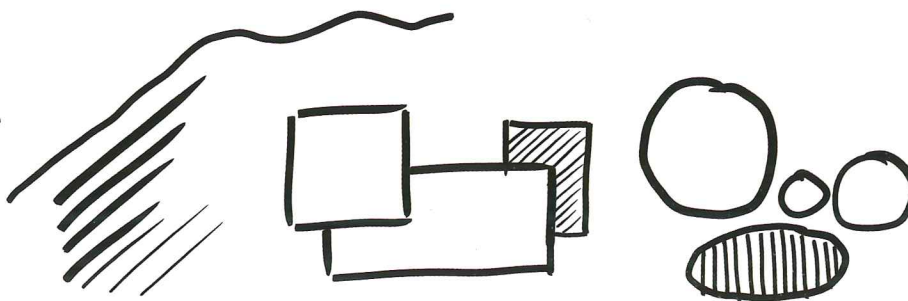
Tip

People Who Sketch on Computers

Libraries of Sketch Elements
Designers sometimes use tablets instead of paper to compose sketches. If this is something you want to do, take advantage of software that lets you save and reuse your sketch elements as a library. For example, and similar to clipart, you can create a variety of elements and save them on a slide in PowerPoint. You can then copy, reuse and maybe even alter them later for use in particular sketches.

Objects
Most drawing software includes a range of drawing primitives: rectangles, circles, arrows, callouts, etc. When choosing software to support your sketching, consider if the range of drawing primitives available suffices to help you in your sketching process.

Clipart
If you use computers for your sketches, you can also take advantage of the many clipart or equivalent libraries of images out there. For example, if you search for 'stick men' on the web, you will likely find many images that fit your purposes.

2 Composing Objects

By combining these basic sketch elements you can compose a variety of shapes and objects that will form part of your sketching vocabulary. Below is a collection of such composed objects – some drawn as simple two dimensional outlines, others in a perspective side view. Remember that simplicity is key: in many sketches it is better to draw objects as simple shapes rather than as detailed and fine grained objects. Note that many of the examples below are in fact very simple combinations of a few rectangles, circles, and lines, but that the level of detail is sufficient to clearly identify the object's function (e.g., the mobile phone, or the photo).

Tools
(pencil, pen, magnifying glass, wrench, scissors)
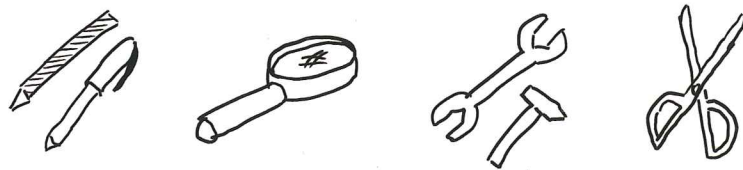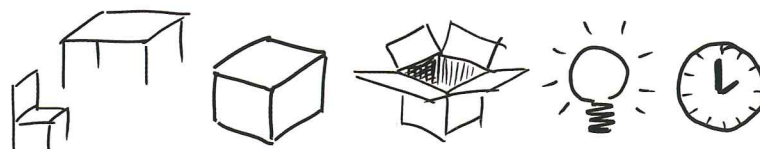
Digital Devices
(camera, phone, cell phone, computer, mouse)
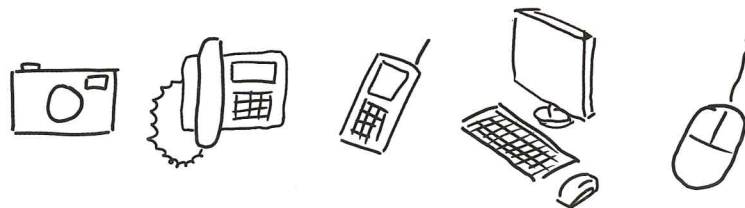
Documents
(paper, books, photos, piles)

Physical Objects
(tables, chair, boxes, light bulb, clock)

### Abstract Shapes
(arrows, signs)

3 People

Many sketches in interaction design include people performing their actions, motions, and activities while interacting with information technology. There are many different techniques to draw people: from simple stick figures to detailed and realistic outlines of a person. Often, simple stick figures are preferable to detailed drawings of people: they are expressive enough to illustrate people and their actions in a variety of situations.
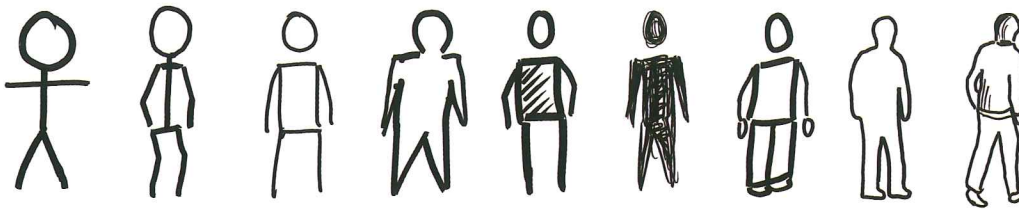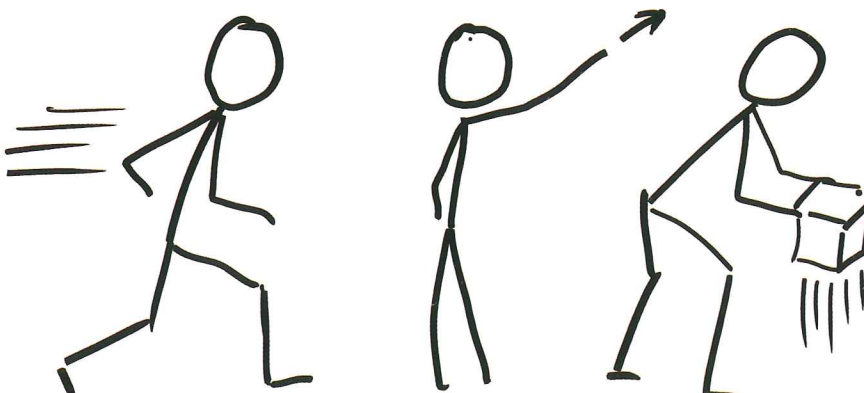
Alternatively, even comic-like sketches or abstract shapes can represent people in your sketches. The choice of drawing style depends on your preferences, but also on the type of sketch you create. For example, in a drawing that just suggests the presence of people, abstract shapes can be sufficient. But in a sketch of (say) a multi-user tabletop interaction, details about people's postures might be important to portray the interaction techniques.
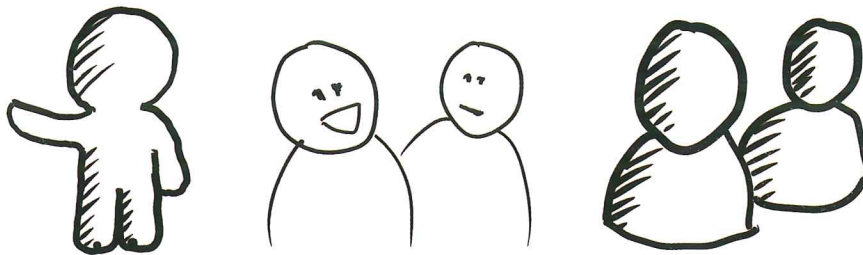
4 Activities

By varying people's poses you can express a variety of different activities. For example, the sketches below show a person's activities, e.g., running, pointing, lifting a box. Notice how two of the sketches use action lines (also called motion lines) to illustrate the movements of the person's activity (also see Scott McCloud's *Understanding Comics*).

5 Bodies and Emotions
Different postures can also show the state of the person: surprised, puzzled, disgruntled. Here, we also used symbols above the head of the person (in addition to posture) as an additional indicator of a person's state.
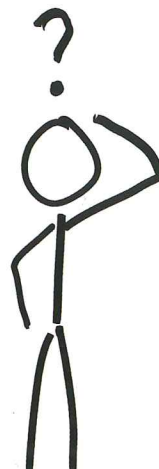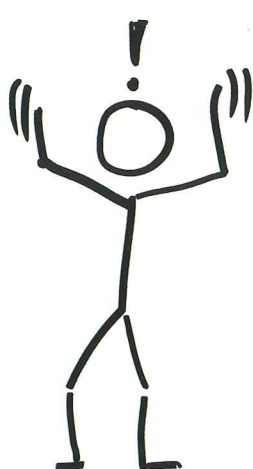
6 Faces and Emotions
Through simple variations of how you draw people's faces (in particular their mouth and eyebrows) you can let your sketched people express their emotions. The 3x3 grid illustrates 9 different combinations of how to draw people's faces, simpy by the way you remix 6 eyebrow and mouth shapes. The result is expressions such as: happy, relieved, sad, angry, confused, or surprised.

Eyebrows

Mouth
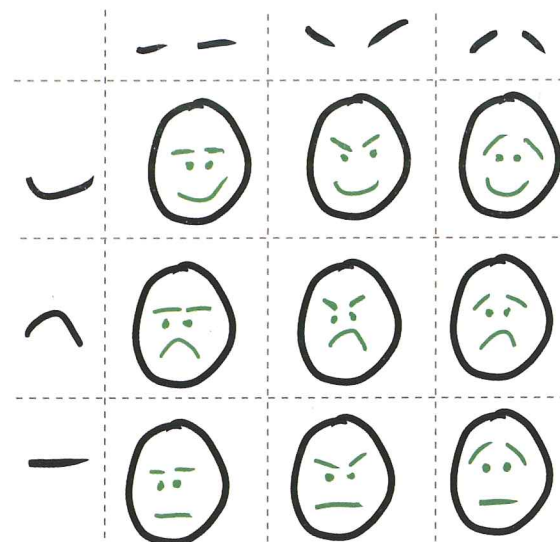
7 **Combining Postures and Faces**

Adding a body posture matching the person's facial expression can amplify how you communicate the person's current emotional state. For example, this sketch shows a person in three different moods: happy and waving the hand, angry and raising the arms, and scratching the head while being confused.
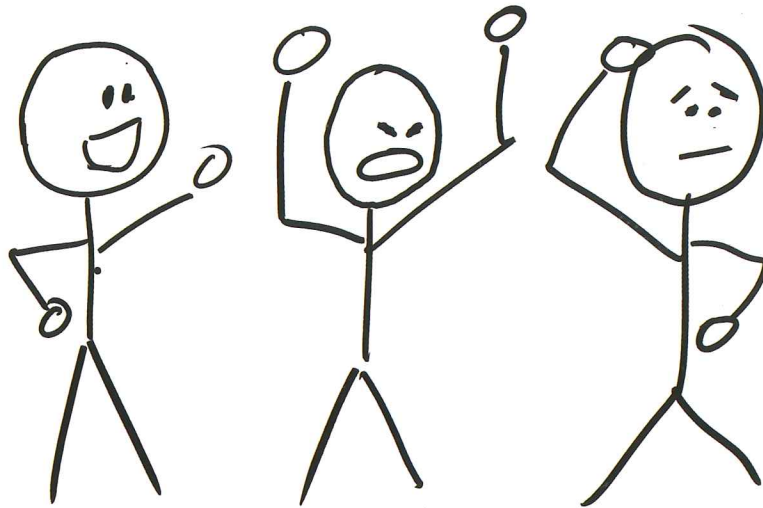
**8** **Combining Different Sketch Elements to Illustrate Situations**

You can combine these postures of people and the simple objects to compose simple sketches that illustrate specific situations and actions. For example, the sketches below illustrate a person in different moods and situations: happy while being on the phone, confused while deciphering a map, and sad while searching the floor for a lost item.

Exercise

Draw a person interacting with a tablet computer in three different situations. For example, you can draw the person while sitting on a chair and reading a book, while showing a document on a tablet to a second person, and while placing the tablet on a table to write a text. Try to vary people's poses and facial expressions.

Our Solution:
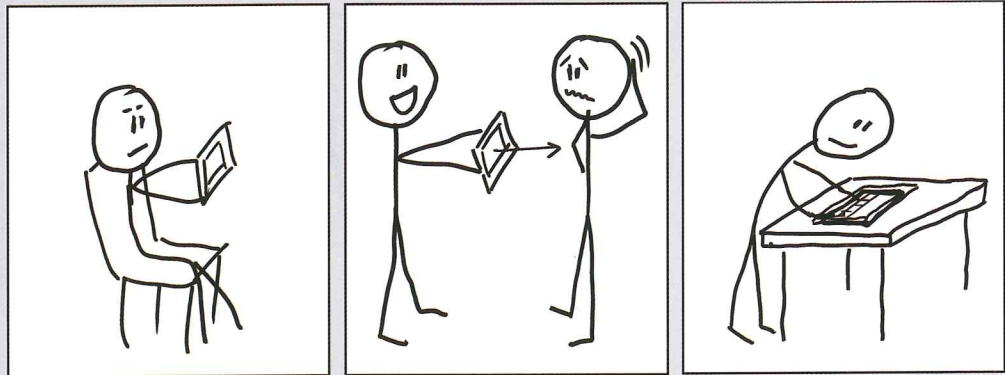
References

Edwards , B. (1999) *The New Drawing on the Right Side of the Brain: A Course in Enhancing Creativity and Artistic Confidence*. Tarcher.

Hanks, K. and Belliston, L. (2006) *Rapid Viz: A New Method for the Rapid Visualization of Ideas*. 3rd Edition, Course Technology PTR.

McCloud, S. (1993) *Understanding Comics. The Invisible Art*. Harper.

McCloud, S. (2006) *Making Comics: Storytelling Secrets of Comics*. Manga and Graphic Novels. Harper.

YOU NOW KNOW

You learned how to build up a sketching vocabulary of simple shapes, objects, and people. By varying postures and facial expressions you can illustrate people in different situations. The sketching vocabulary functions as a starting point for many of your sketches about people's interaction with technology.

But don't stop here! Look for the many primers that teach people how to sketch, especially those oriented toward kids and comic books. As we keep on repeating, you don't have to be a superb artist to sketch. But you will find that knowing and practicing a few of the basics will help you immensely over time.

There are an infinite number of ways you can create a single sketch. However, most simple sketches will comprise the drawing along with optional annotations and notes.

THE DRAWING

The drawing is what most people think of as the result of a sketching activity. For example, the figure below is a sketch of the main screen of an interactive shopping system, expressed solely as a drawing.

ANNOTATIONS

Annotations are names, labels and explanatory notes whose spatial location identifies the part(s) of the sketch they refer to. That is, annotations are graphical marks that are incorporated into the drawing itself.

Sometimes, their location relative to a part of the drawing is enough to connect the annotation with a particular sketch element. Other times, arrows, lines or braces may clarify that spatial relation. For example, the sketch below now includes annotations. This particular sketch shows various labels and explanatory notes that:
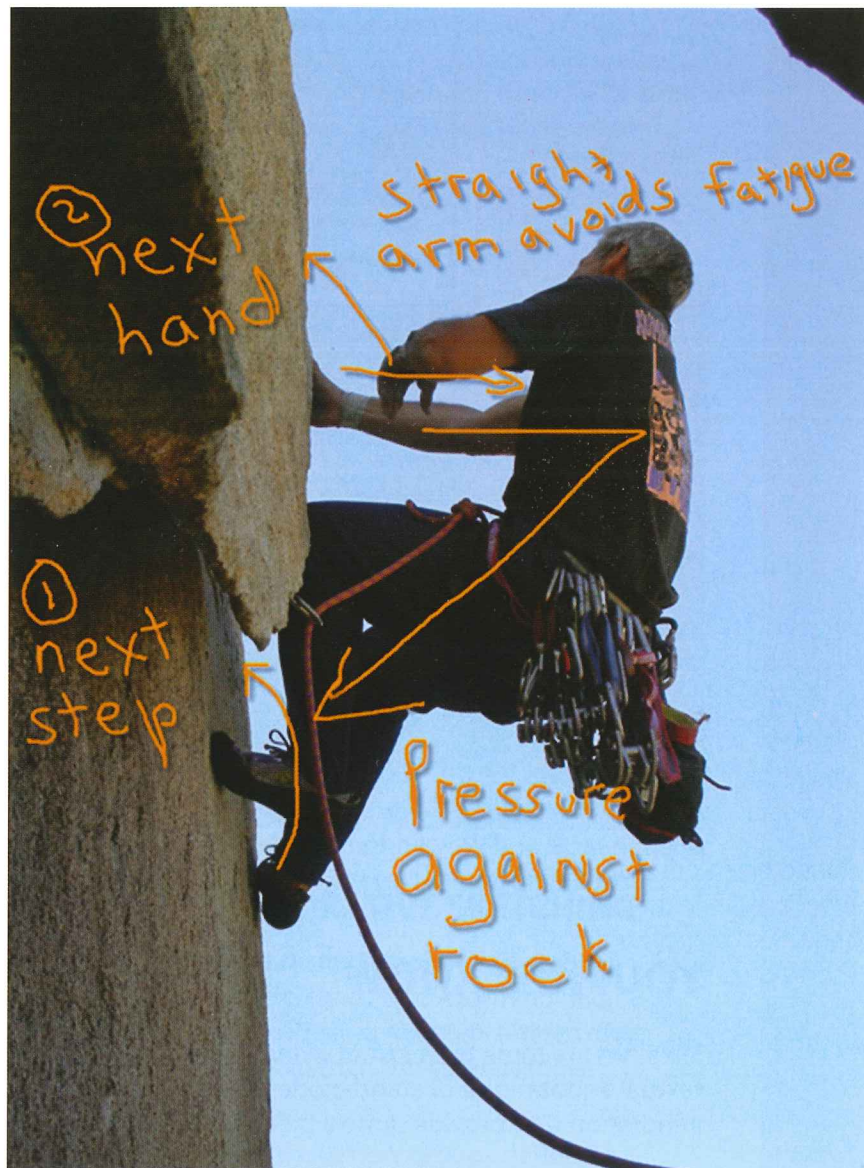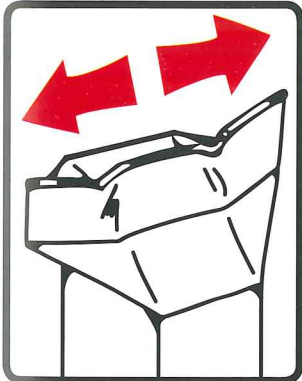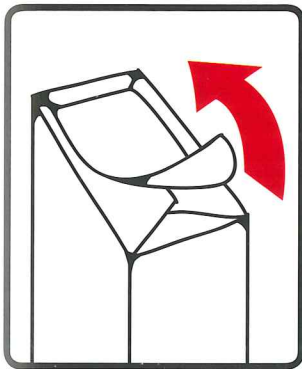
- indicate particular areas of the sketch via braces (e.g., those numbered 1–4 and 7),

- point to specific elements via one or more arrows (numbers 5 and 6),

- are associated by only their spatial placement, such as the label explaining the caricature (number 8),

- indicate dynamics of elements or interactions over time (labeled arrows in the middle of the figure).
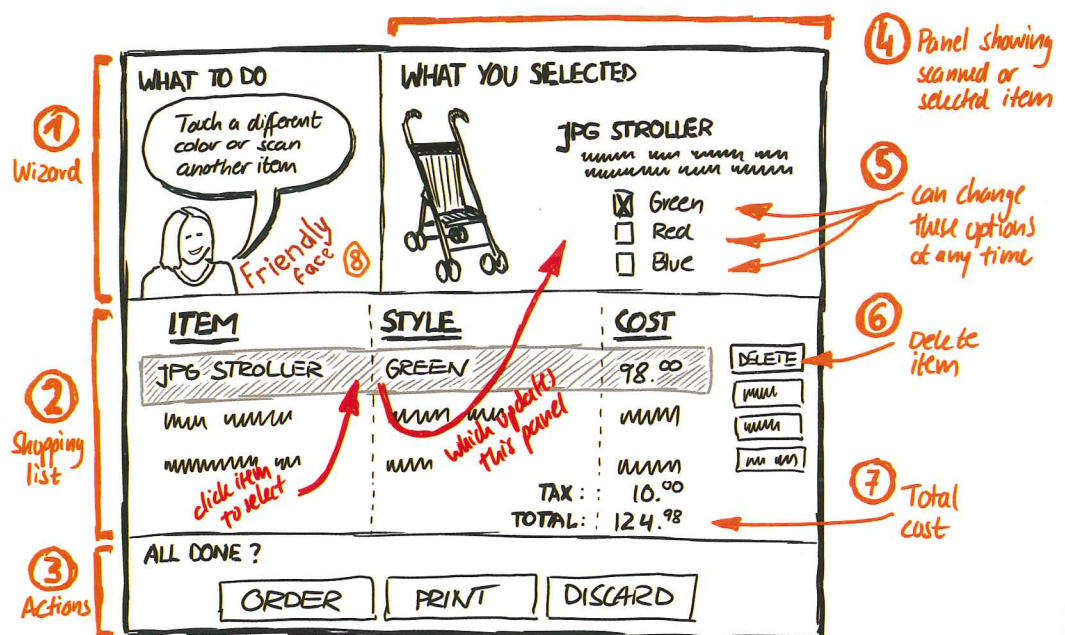
Arrows as Annotations

Arrows deserve special mention as part of an annotation. We already saw in the previous sketch how they can be used to point to one or more areas of the drawing. Arrows can also be used to relate different parts of a drawing, to indicate direction, to show movement, to indicate a sequence of events, to indicate interaction flow.

For example, the set of images on the left below are directions in opening a box, where arrows eloquently indicate the interaction flow and movement (taken from Mijksenaar and Westendorp, 1999). The image on the right is another example, where in this case the person has annotated a photograph of a rock climber to indicate numbered sequences of events, where arrows and labels indicate directions, force, and movement.
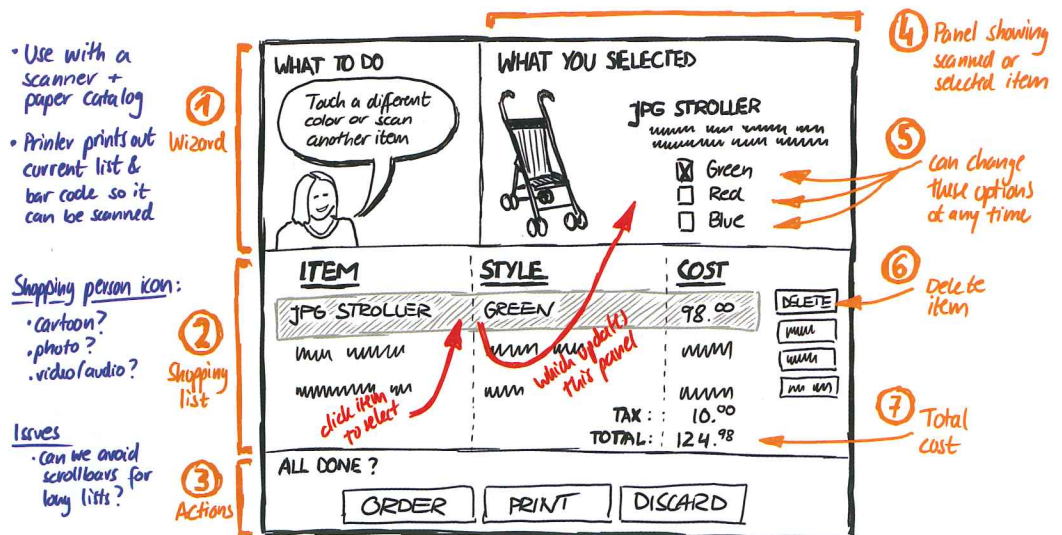
NOTES

Notes are any text incorporated in the sketch where its spatial location relative to parts of the drawing is not important. For example, this 3rd version of the sketch has several notes included on its left side. Notes can be anything: ideas about design elements not included in the drawing (top note), alternate design options of elements within the sketch (middle note), a set of issues (bottom note), explanations, alternate ideas not yet sketched out, outstanding questions, and so on. They can be paragraphs, words, sentence fragments and lists.

Both annotations and notes are there to help you elaborate your ideas about your drawing, especially so you can recall them later. Freely use annotations to elaborate your drawing, especially if a few words will help you explain various (possibly obscure) drawing elements, e.g., what they are, how they behave, the abstract concept it represents. Freely use notes to capture thoughts about the drawing as a whole. Don't worry if your sketch is text-heavy; if it helps you, then the sketch is serving its purpose.

References

Mijksenaar, P. and Westendorp, P. (1999) *Open Here. The Art of Instructional Design.* Joost Elffers Books, New York.

YOU NOW KNOW

Sketches are more than just drawings. They can incorporate spatially relevant textual annotations, or stand-alone textual notes. Arrows are a special kind of annotation that provide quite a bit of illustrative power.
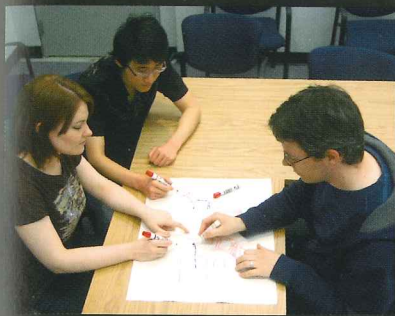
Sketching is not only something you do by yourself but, as mentioned in the previous chapter, is something you can do with others. As you will see shortly, the collaborative sketch you create serves a somewhat different purpose than sketches you do by yourself.

Before reading on, try this exercise. Get together with one or two others, and sit around a table with large sheets of paper on it. The paper should be large enough and the table small enough so that all can reach into the drawing area easily while still having room to do their sketching without interfering with each other. Now work together on the following design problem with your team for about 10–15 minutes. As you do this, try to observe yourselves: how you sketch as a team, and how you interact over the sketch. Now try continuing this exercise for another 10 minutes, but this time tape the paper to a wall (or use a whiteboard).

Materials

- three to five people
- table
- large pieces of paper
- pencils and whiteboard pens for everyone
- whiteboard
- tape

Exercise

The Interactive Fridge

An appliance vendor is producing a refrigerator with a touch monitor and camera embedded in its front. The vendor wants you to design an interface where a person can create a shopping list on this monitor. The interface will allow that person to modify this list, print this list, email this list to others, and use the list as the basis for navigating to (and ordering from) web-based on-line shopping systems. The system will have software that can recognize product bar codes (although not perfectly), a database that you can populate with standard shopping items, and a touch sensitive display where menus and buttons can be selected.

ACTIONS AND FUNCTIONS OF COLLABORATIVE SKETCHING

From the above experience, you may have noticed that collaborative sketching is as much about group interaction around the sketch (e.g., brainstorming and commenting on each other's ideas) as it is about producing a sketch. Indeed, the sketch itself as produced may have been less valuable than the conversations around it.

Let us relate your experiences with what we know about how groups generally collaborate while sketching.

GESTURES: SKETCHING WITH OTHERS

In 1991, John Tang studied small groups of people designing together – sketching – over large sheets of paper. He categorized every person's activity according to what action and function it accomplished, as listed below.

Actions:

- *listing* produces alpha-numeric notes that are spatially independent of the drawing;
- *drawing* produces graphical objects, typically a 2-dimensional sketch with *textual annotations* that are attached to the graphic;
- *gesturing* is a purposeful body movement that communicates specific information, e.g., pointing to an existing drawing.

Functions:

- *storing information* refers to preserving group information in some form for later recall;
- *expressing ideas* involves interactively creating representations of ideas in some tangible form, usually to encourage a group response;
- *mediating interaction* facilitates the collaboration of the group, and includes turn-taking and focusing attention.

As seen above, Tang saw that collaborative sketching involves the drawing sketch, annotations and notes that are common with individual sketches, where its primary function is to produce a sketch that can be stored and retrieved later. However, Tang also saw a third basic element: gesturing. Gesturing, which is often overlooked as a collaborative sketching activity, comprised ~35% of all actions, and was used by participants to express and enact ideas, to signal turn-taking, to mediate interaction, and to focus the attention of the group.

The reason this is important is that the sketching medium and how it is located in the group's working area may or may not be conducive to gesturing or mediating their interactions.

For example, recall how you worked around the table. Tang noticed that people sitting around a large piece of paper on a table (e.g., as in the figure) tended to work, sketch and gesture simultaneously around it, as they can all reach into the sketch comfortably.

However, if the paper is taped to a whiteboard, bodies get in the way. As a result, one person may 'lead' the sketch with the other people observing and commenting on it from a distance. Some people may even sit away from the whiteboard. Instead of simultaneous interaction, turn-taking or even only one person acting as the 'scribe' is more likely. While seemingly small, these differences matter in collaborative sketching, as it will affect how people communicate and interact.
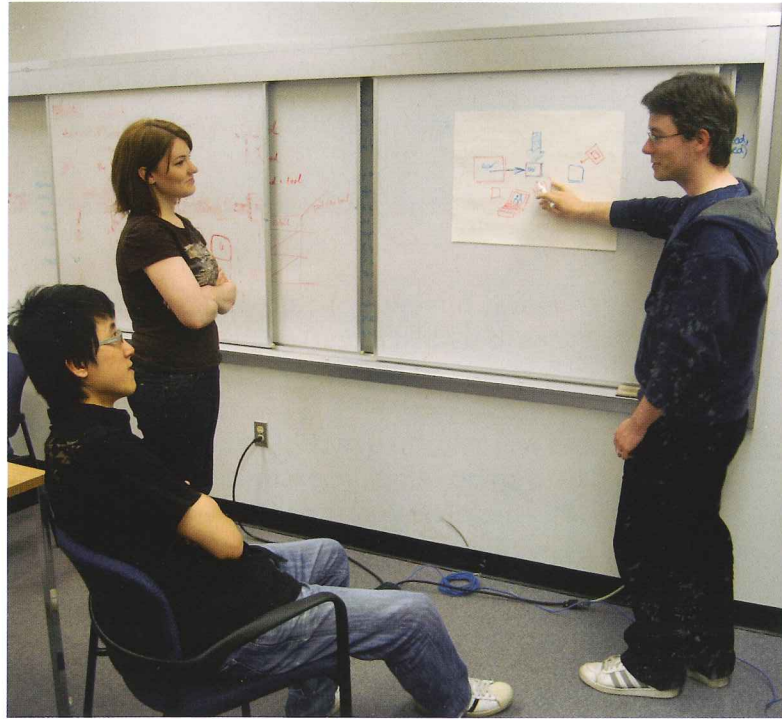
Other configurations will affect how people work together. For example, and as will be discussed in Chapter 3.6, using drawing software instead of pencil and paper can negatively affect engagement and simultaneous interaction. This is due to the single input device (the mouse), people's unequal knowledge of the software tool, and time spent on those parts of the interface that are secondary to drawing (e.g., navigating screens, dialog boxes, selecting from menus and pallettes).

References

Tang, J. C. (1991) *Findings from observational studies of collaborative work.* International Journal of Man Machine Studies, 34(2), pp. 143–160, February. Republished in Greenberg, S. (1991) Computer Supported Cooperative Work and Groupware, Academic Press.

YOU NOW KNOW

When sketches are done corroboratively, thought must be given on how participants can reach into the sketching space and add marks to it (preferably simultaneously), all while being able to talk and gesture over the drawing.

Paper and pen are fantastic sketching tools. They are cheap, portable, and always on. Best yet, you and your colleagues have years of training (since childhood) and experience using a pencil.

However, digital tools have powers that paper and pencil lack. In particular, you can easily modify sketches made with digital drawing tools, make multiple copies, print them repeatedly, use them as templates, and – as we will see in later chapters – create interactive sequences via animations and linking if the tool allows it. As well, if your pencil drawing skills are poor, the digital drawing tool will likely help you produce better looking sketches (if warranted).

In contrast to a paper sketchbook, you will incur some costs when using a digital drawing tool over pen and paper. It will take you time to turn it on, which may inhibit you from capturing ideas on the fly. Unless you have a pen-based computer or equivalent, doing freehand sketching with a mouse is painful. You will have to learn how to use (and remember) the tool's advanced features. You will have to manage your sketches as files rather than as a sequence of pages. You will find it harder to review your sketches, as you now have to find, open, and close these files.

There are many digital drawing tools on the market, and some are even specialized for sketching. In this chapter, we deliberately concentrate on **slideware**, i.e., software used to make slide presentations. We use this software because they have valuable sketching features above and beyond their digital drawing capabilities, and because almost everyone already has one installed on his or her computer and knows how to use it.

SKETCHING IN SLIDEWARE

Software for creating presentations is fairly ubiquitous, with the two most commonly available ones at the time of writing being Microsoft PowerPoint and Apple's Keynote. They have powerful drawing and manipulation tools, as well as access to stock images. We will concentrate on these drawing features in this chapter. In addition, these tools also let you do play sequences as slide shows, and allow for animations and hyperlinking; we will discuss the power of those functions in later chapters.

We will primarily use Microsoft's PowerPoint, illustrated below, as our example slideware tool; other presentation systems are similar. We will just quickly review PowerPoint's basic drawing building blocks, where you draw by creating, moving, copying and manipulating the objects and their properties. You probably know how to do this already. The main point of this chapter, as we will see, is to contrast the powers and weaknesses of using a digital vs. paper-based tool.
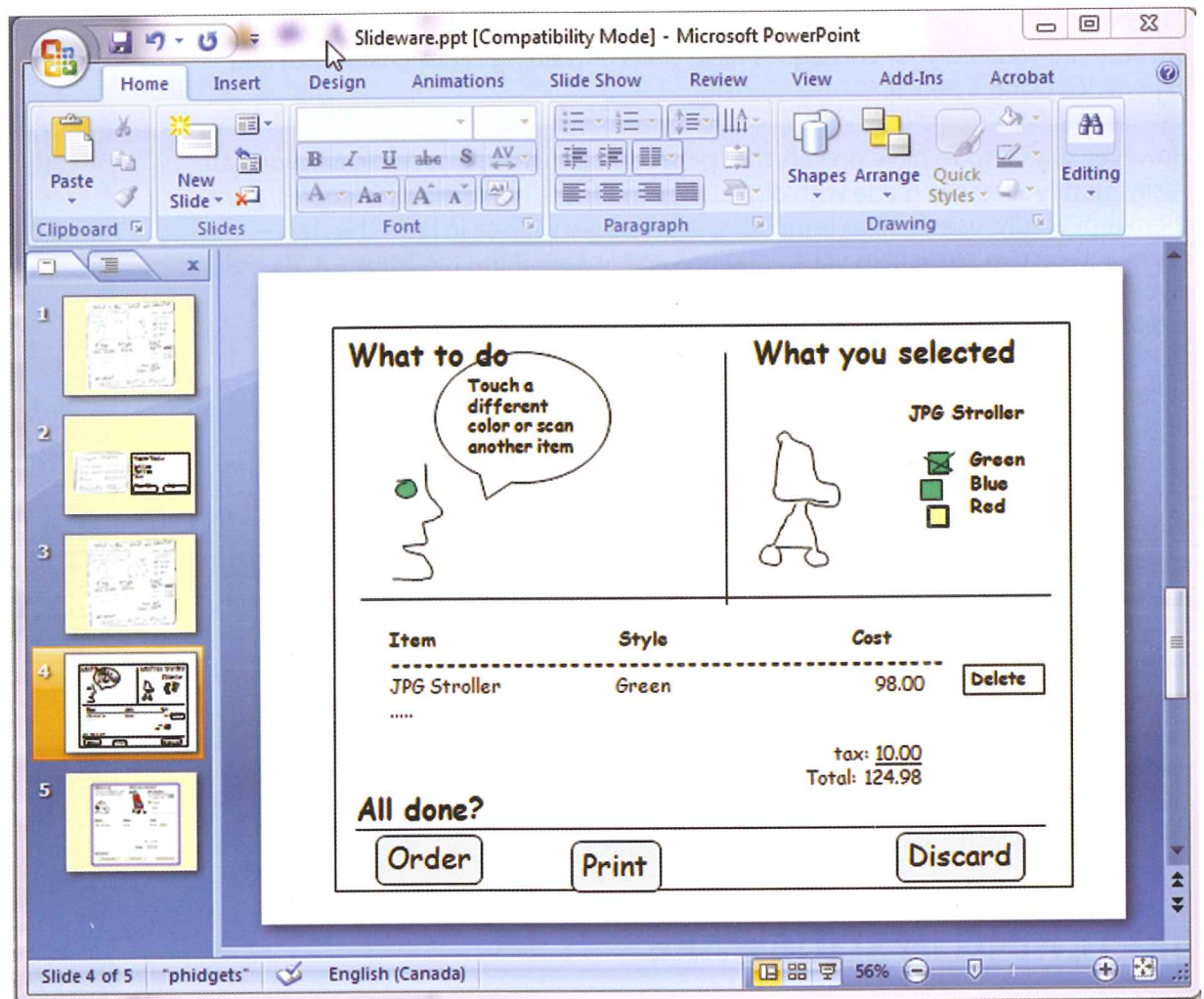
Slideware packages usually have a large variety of pre-defined shapes with many adjustable properties. They also usually include many custom shapes and variations. For example, the PowerPoint **shapes** palette, shown at the right below, illustrates the rich set of pre-defined drawing shapes. The **line** sub-palette included in the shapes palette shows the various types of lines available: straight lines, lines with arrows, lines with corners, curves, splines, and even free-form drawing lines. Properties of already drawn lines can be further altered, for example by changing the thickness (middle figure) and / or switched into one of the many forms of arrows (left), or by changing the color, gradient or even texture (bottom left). **Basic shapes** range from different styles of rectangles, textboxes, circles, different triangles, parallelograms, different kinds of braces, and others. More custom shapes include happy faces, lightning bolts, **flowchart** symbols, various **block arrows**, and **buttons**. There are even various forms of **callouts**, which are excellent for annotating a drawing. Properties of these shapes can be altered at will, e.g., how it is filled or outlined (bottom palette). Of course, presentation packages also include myriad options for text, including font type, size, alignment, color, indentation, character and line spacing, and others (top palettes).
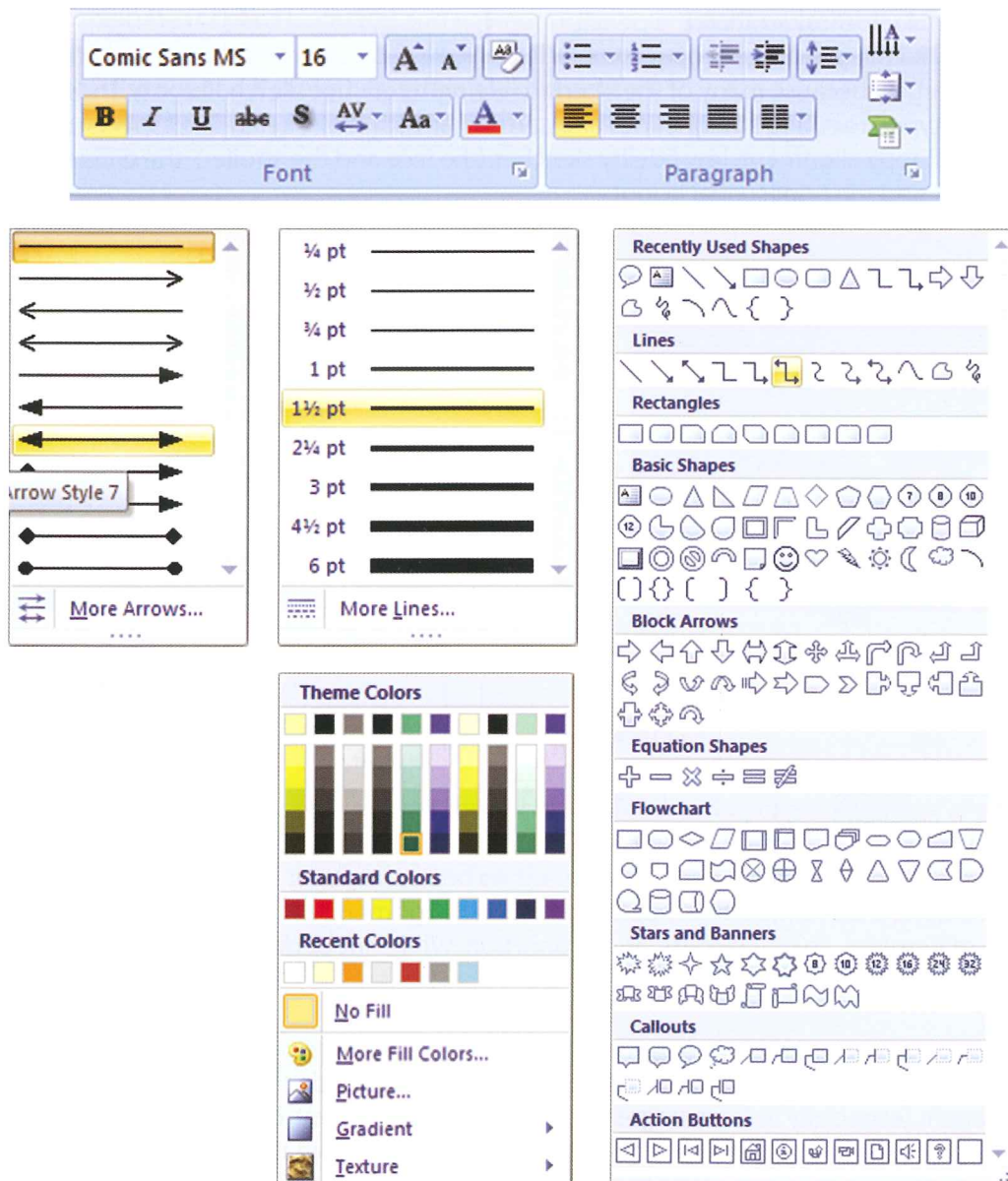
DIGITAL VS PAPER-BASED SKETCHING

To get into the spirit of things, try the following. Time yourself. First, using paper and pencil, quickly reproduce a rough sketch of the shopping system on the right. How long did it take you?

Next, as quickly as possible, try to reconstruct your own version of this same shopping system as a single slide in your own slideware software. How long did that take you?

The version I created, done in PowerPoint, is on the left below. It didn't take that long to do, although it did take me longer than the pencil version. But unlike the pencil sketch, it just looks wrong. This is largely because many of the interface elements are not sketch-like, e.g., their nicely shaped boxes, typed text, and straight lines and corners jar with their sketch-like aspects, including irregular lines, sloppy alignment, low fidelity sketches (the face and the stroller), the differences between sizing, and the poor spatial layout.

Now try redoing the sketch on the left, but instead try to make it look reasonably 'right'. My version is shown below on the right.

This did take quite a bit longer. I now paid attention to alignment, fonts, color, shading, the placement of graphics, spatial layouts, and proportion. While not perfect, that is why it looks reasonable.

What should be apparent right away is that this 2nd version produces what looks like a high fidelity screen shot. Yet the information contained is more or less identical. While its good looks can be a benefit (especially in later stages of the design funnel), it introduces a problem if done in early stages. To make this 2nd version look good, I had to spend more time deciding on issues such as text size, alignment, the look of the buttons, spatial layout, and so on, which have little to do – and indeed can interfere – with capturing the basic design idea as a quick sketch.