**Chapter 8 Questions and Answers**

1. Describe ways designers have tried to improve on traditional qwerty keyboards.

Dvorak layout, ABCDE style, orbiTouch keyless keyboard, pointing devices such as mice, touchpads, or eye-trackers for data entry. Key design and placement.

1. Explain the difference between direct-control and indirect-control pointing devices.

**Direct control devices**. Easy to learn and use, but hand may obscure display.

* Lightpen
* Touchscreen
* Stylus

**Indirect control devices.** Take time to learn.

* Mouse
* Trackball
* Joystick
* Trackpoint
* Touchpad
* Graphics tablet

1. Your elderly grandfather is a new computer user. Recommend an input device or devices that might serve his needs better than a mouse. Justify your choice.

Wide range of answers possible. A good answer might consider the specific needs of the user, i.e. vision impairment, fine motor difficulty resulting from arthritis, etc. Possibilities: 1. Touchscreen interface with speech synthesis or sonification to describe the display, read menu options, and confirm selections. 2. OrbiTouch-style keyless keyboard to reduce range of motion requirements for hands. 3. Natural language/voice input. 4. Enlarged keyboard and/or cursor for vision impaired.

1. Summarize the advantages and disadvantages of using a speech generator instead of a visual screen.

Speech becomes advantageous to users when their visual channels are overloaded; when they must be free to move around; or when the environment is too brightly lit, too poorly lit, subject to severe vibration, or otherwise unsuitable for visual displays. Text-to-speech utilities like the built-in Microsoft Windows Narrator can be used to read passages of text in web browsers and word processors. Screen readers like Freedom Scientific’s JAWS allow users with visual impairments to productively navigate between windows, select applications, browse graphical interfaces, and of course read text. n some cases, the novelty wears off, leading to removal of the speech generation. Talking supermarket checkout machines that read out products and prices were found to violate shoppers’ sense of privacy about purchases and to be too noisy. Similarly, annoying warnings from cameras (“Too dark—use flash”) and automobiles (“Your door is ajar”) were replaced with gentler tones and red-light indicators.

1. Recommend strategies for creating an interface optimized for a small screen device input.

Provide support for one-handed interaction. Place targets close to one another to minimize grip adjustment, allowing users to configure tasks for either left- or right-handed operation. Place targets towards the center of the device. Take advantage of every pixel. Offload secondary tasks to desktop applications. Consider compact overviews, ability to zoom in and out, and rapid serial visual presentation (RSVP), which presents text dynamically at a constant speed or at a speed adapted to the content.

1. Describe the advantages and concerns for a user of a device using context-aware computing. How might businesses benefit from having customers use context-aware computing devices?

Users get information at the point of need. Privacy might be compromised. Stores can greet customers with directions, coupons, and other useful items when they are nearby.

**Key Terms and Concepts**

1. Fitt’s Law
2. Direct Control vs. Indirect Control Devices
3. Ubiquitous Computing
4. Haptic Feedback
5. Auditory Icons