

# Chapter 104

## The Changing Face of Assistive Technology: From PC to Mobile to Cloud Computing

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### ABSTRACT

*Computer-based Assistive Technology (AT) has had a powerful effect on people with disabilities in the areas of reading, writing, communicating, and accessing information. One of the roadblocks for use has always been the expense of AT. Advancements in computing and mobile technology, however, are making some technology more readily available, accessible, and cost effective for people with disabilities. Computer operating systems, for example, now contain features to magnify screens for reading and in the entering of text. The mobile movement of smartphones, e-readers, and tablets has also been changing the way people with disabilities access information. The capabilities of these devices combined with the immediate availability, affordability, and ease of use, has been making the world more accessible for people with disabilities, and with mobile devices increasingly becoming a necessity for most, this trend is anticipated to only continue.*

### INTRODUCTION

Assistive technology (AT) has been around as long as people have been attempting to compensate for injuries or disabilities. It could be argued that the first time a stick was used as a crutch, the field of AT was born. Assistive technology began to gain momentum during war time with soldiers returning from battle with physical injuries and other impairments that required tools to help them compensate (Bryant & Bryant, 2003). Since then,

many different types of tools have been developed to help people communicate, read, make their homes more accessible, travel, and so on. There will always be a need for AT to help people with disabilities. However, as technology continues to evolve, and devices, such as e-readers and tablets continue to permeate everyday life, many technologies that were once solely available as AT are now commonly available as “accessible technology.” Assistive technology is typically associated with individual use, whereas this new

DOI: 10.4018/978-1-4666-8789-9.ch104

trend of accessible technology provides greater access to a wide range of people. This trend is most evident with technology that can be used to help those with visual and hearing impairments.

For example, prior to the proliferation of email and text messaging, people with hearing impairments relied heavily on AT. Typical communication modes included sign language, text telephones (TTY), and relay services. Sign language creates a challenge for many in that it requires the learning of a new language, and so, very few people who do not have hearing impairments, are able to sign. It is estimated that between 100,000 and 500,000 Americans use sign language, and this predominately includes those who are deaf, hearing children of deaf parents, and fluent deaf signers (Wilcox & Peyton, 1999). Given this, it could be argued that sign language works very well for a small percentage of the population, but in terms of widespread use, it unfortunately falls short.

Consider next the TTY device, which connects to a telephone and allows the person who is hearing impaired to either type a message or view a message on a screen. This technology works well if both parties have a TTY device. However, when communicating with someone that does not have such a device, a relay service must be used. In such an instance, both parties would call the relay number, the caller with the TTY device would type a message, a relay operator would read the message to the caller without the device, this caller would then speak a message to the relay operator, who would then type the message to the other caller's TTY device. Although this device works well, it adds an extra step to the communication process, and in regard to the relay service, third-party involvement (i.e., an operator).

### **E-Mail, Instant Messaging, and Text Messaging**

With e-mail, instant messaging, and text messaging now part of everyday life, such complexities have been almost eliminated. People with hear-

ing impairments now have immediate access to forms of communication that connect them more easily. Instead of purchasing a special device for their phone or communicating through a relay service, these individuals now have many of the same communication options as everyone else. To use email, for example, a person only needs a computer and an Internet connection, and to use text messaging, a person only needs a smartphone with a text or data plan. Furthermore, since text messaging has become one of the most popular ways in which to communicate, smartphones with text plans are now affordable, readily available, and easy for almost anyone to use, including those with hearing impairments (Madar, 2012).

Although statistical data is not widely available on how accessible technology, such as email, instant messaging, and text messaging have affected the use of certain traditional AT, the use of TTY, for instance, is now often referred to and viewed as a "legacy" device. This could be argued as the first example of how accessible technology has had a profound effect on providing greater access to people with disabilities. The rest of this chapter discusses this line of thinking, presenting accessible technologies that have or are quickly becoming part of the mainstream and every day, but which have already shown, or have the potential to be incredibly helpful to those with disabilities; in particular, those who have visual and hearing impairments. In doing so, this chapter is presented in terms of the three biggest areas of technological change in recent years: mobile, personal computer (PC), and cloud computing.

## **ACCESSIBLE TECHNOLOGY**

### **Mobile Computing**

It could be argued that the biggest area of recent technological advancement has been in the area of mobile computing. These devices, to include smartphones, e-readers, and tablets, along with

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