

## Chapter 14

# Survey of Information Technologies in the User Environment

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### ABSTRACT

*Along with the shift from print to digital formats, information technologies are significantly affecting today's libraries. New technologies and concepts such as mobile devices, social networking sites, communication and interactive tools, and other Internet technologies are changing how libraries serve their patrons as well as how users interact with libraries and each other. Each technology has impacted the library user and the user environment so much so that today's library is said to be everywhere. Wherever the user can go with their mobile device and access the Internet, and therefore the library OPAC, it can functionally be said that they are at the library, for the collection, user services, and library databases is where the library is located, not the brick and mortar structure. This increased access also raises concerns over online information security and privacy, and the conscious Internet user needs to be aware of the dangers and take the necessary steps to mitigate them. The concept of change is another element of these new information technologies—embracing it, for technology is always changing as new ideas spark new revolutions in development and libraries must change along with them. All information institutions must learn to ride these waves of change instead of being pulled along, half drowning, by the undertow. Learning to both integrate and inform patrons on how best to use these technologies becomes an important part of being an information expert. Surveyed in this chapter is a selection of those important and driving technologies and changes.*

### INTRODUCTION

The modern ability of individuals and organizations, through the use of computers and networks, to collect, transfer, and process large amounts of information around the world in a relatively short period of time has been the driving force in many of the recently developed technologies, especially those on the

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open market accessible to the general public. These new information technologies, along with the move of institutions to convert their current collections to virtual access and for publishers of content both public and private to publish their new content in diverse digital formats, have had the greatest influence on libraries in the 21st century—so much so that the developed world has referred to this period in human history as the Information Age. A brief outline of some of the more important information technologies that are driving the general public's access to information are surveyed in this chapter.

Though the marked increased access to information by the general public has also driven an increased rate of consumption for that information, the traditional push for development of modern and new technologies is not focused on these objectives; it has remained corollary. Information technologies, many of which are directly related to the technologies we use every day in our libraries, have also dominated the developments of many governments around the world, such as global superpowers and their dependent allies. Nations such as the People's Republic of China (PRC) has invested large amounts of resources and talent in developing sophisticated cyber warfare capabilities focused on and delivered through information technology—ideally to attack the communication infrastructures and conduct intelligence gathering operations in support of other political and military operations, particularly against their biggest threats to projecting political influence in Asia, the United States and Japan, as well as exert useful control and influence on international and foreign corporations for national interest. Case in point is the suspected direct involvement of the Chinese politburo, the ruling organ of the State, in the hacking of Google's operations based in China in 2010. The alleged Chinese government directed cyber-attacks came soon after Google refused to censor their search results for their Chinese customers, citing their international terms of usage. The Chinese government claimed that personally critical comments concerning members of the Chinese politburo could be searched and accessed by Chinese citizens through Google's world-wide search engine. These cyber-attacks, and the threats generated from additional attacks, were so critical that Google relocated their Chinese operations to Hong Kong, which is slightly more autonomous within the PRC (BBC News, 2010).

Of course the United States, Russia, and other important powers invest equally in these capabilities for the same reasons. Modern militaries rely heavily on stable communications and network services in order to conduct their operations, especially when it comes to joint maneuvers between service branches and allies deployed over a large theater of operations. These communication networks become the first and most beneficial vector of attack for an opposition force. In scenarios similar to the 2010 PRC-Google case study, if used successfully at the opening stages of a potential world conflict, either large scale or small scale, or as a possible deterrent to such a conflict, a successful cyber-attack might paralyze NATO members' communication infrastructure, and as a corollary their economic and electric power grids, just long enough to help off-set the West's huge advantage in nuclear and highly sophisticated conventional weapon systems deliverable by their projected naval and strategic air forces. Cyber warfare and tactics focusing on disrupting communication infrastructures saw major successes in the opening stages of The Persian Gulf War in 1990-91; particularly, in the military strategies behind Operation Desert Shield/Desert Storm where the destruction of the Saddam regime's ability to communicate with their large forward military commands greatly demoralized the later and paralyzed their ability to respond to the coalition's forces. Iraqi military responses against the invading forces were uncoordinated and poorly engaged, leading to extremely heavy casualties for the Iraqi formations followed by rout and surrender. Use of such softening tactics as preliminaries to more conventional operations are also the Achilles' heel for the American military, which depends heavily on combined arms tactics and centralized command

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