

## Just What Is Multimedia, Anyway?

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With all the hype circulating around multimedia and its numerous offshoots—new media, digital media, interactive media, and so on—does anyone really know what this term means?

And what are the origins of multimedia? Did it begin with the CD-ROM in the early 90s, the interactive laser disk of the late 70s, or if you're old enough, 1960s "multi-media" performance art (note the old-fashioned hyphen) and rock concert light shows?

Multimedia is an utterly misunderstood term used to describe the variety of applications that integrate media types, from CD-ROM to live performance to the Internet. More and more, the artistic, entertainment, and educational content

we experience daily takes the form of multimedia. It will become even more pervasive with the convergence of film, television, and the Internet in the next century,

So, before we turn the millennial corner, it seems imperative that we have some conceptual tools for thinking about multimedia, which has been with us not for 30-some odd years, but rather for several millennial seasons. In this quest for a broad definition of multimedia, including its evolutionary origins, I intend to take us on a fast-paced historical sojourn, defining the essential elements of multimedia along the way—immersion, interdisciplinarity, hypermedia, interactivity, and narrativity—and revealing the important confluence between the arts, human-machine interface, and information technology.

### Artful Media—Celebrating Art and Technology

The explosion of affordable technologies—both hardware and software—has contributed to the spread of multimedia in the arts and a pervasive breakdown of the boundaries between art and technology. Whereas even 10 years ago collaborations between artists and technologists were championed as groundbreaking, today we view such alliances as customary, perhaps even required. Artistic and technological partnerships have moved from defining a particular "state of the art" to becoming the state of all arts and, some might argue, the state of all imaginations, technologies, and productions.

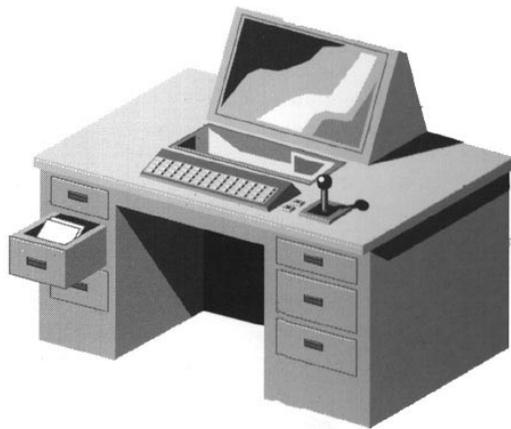
Despite this, the roles of the artist and that of the technologist in these collaborations are often distinct, and the spheres of influence of these separate worlds remain unbalanced. Whereas the influence of technology on art is apparent and well documented, art's impact on technological innovation is not. As soon as a new technology is available, artists are compelled to use it to create new art forms, but when art precedes technology, the associated technology is developed at its own pace, independently, and often much later. This inequity may have something to do with the lack of symmetry in the perceived roles of the technologist versus the artist: technologists develop new technologies to solve specific problems, while artists create new solutions with the technologies at hand. Collaboration between artists and technologists as equal partners has the potential to bridge this gap, and multimedia, by its nature, can be the catalyst to send these two worlds colliding, to merge and mutate, accelerating innovation and broadening its scope. This column will be devoted to celebrating the mix of art and technology.

—Dorée Duncan Seligmann

### Immersive caves

This journey begins with the most ancient of art forms, the prehistoric paintings found at the Caves of Lascaux in the Dordogne region of Southern France dating from around 15,000 BC. Here early man first painted murals of hunted animals, shamanistic figures, and cryptic symbols on cave walls deep within the earth. What does this have to do with multimedia? Let's proceed...

Imagine a ritualistic gathering of the Magdalanian people who inhabited Lascaux, an event that might have taken place in one of Lascaux's sacred caverns, the Hall of the Bulls. Life-sized paintings of the enormous creatures encircle the resonant chamber, echoing with the murmur of whispering voices. Light from stone candles burning animal fat flickers mysteriously on the rocky walls. This ancient ceremony, a hybrid of performance, visual representation, ambient sound, and even olfactory sensation, all takes place in what is perhaps humanity's oldest artistic medium, the site-specific installation. Here we can ascribe one of the key attributes of multimedia: immersion. We are multisensory beings. It only stands to reason that the origins of art would begin in a medi-



**Figure 1. Vannevar Bush's Memex machine.**

um that engages all the senses, an immersive experience that envelops the viewer in a 3D environment made up of image, sound, symbols, and, in this case, odor.

#### Embracing interdisciplinarity

Leap nearly 17,000 years into the future. It's 1876 and the occasion is the premiere performance of Richard Wagner's opera, "The Ring." This four-part epic drama debuted at the Festpielhaus theater in Bayreuth, Germany. Of course, Wagner was no ordinary composer, and the Festpielhaus was not the typical opera house of its day. Wagner held the notion that opera should be more than a showcase for singers. He envisioned a more powerful and complete experience, the Gesamtkunstwerk (Total Art Work), in which music drama serves as the vehicle for integrating all the art forms into a single, unified medium of artistic expression. He had embraced another essential element of multimedia: interdisciplinarity, that is, the cross-disciplinary blending of art forms and art media.

To accomplish this, Wagner revolutionized the entire medium of opera, devising an artistic language that incorporated themes to interlock all the elements—music, story, scenery, and movement—into a coherent dramatic form. Wagner also redesigned the theater to create a more immersive experience: he reintroduced Greek amphitheatrical seating to focus the audience's attention on the stage (as opposed to the tiered balcony of former houses); he was the first to turn the house lights down in the theater, setting the atmospheric mood; he hid the orchestra in the pit, clearing the stage of this distraction; and he rethought the theater's acoustical design to pro-

duce a resonant, surround-sound effect. As a result of these innovations, the Festpielhaus became an interface for drawing the viewer into the virtual world enacted on stage.

#### Hyperlinking the cultural record

The clock again races ahead. It's 1945 and World War II has just ended. America's chief scientist Vannevar Bush proposes that we find new ways to apply emerging information technologies to humanitarian purposes after the catastrophic bombing in Japan that ended the war. He formulates his ideas in an article published in the *Atlantic Journal* titled, "As We May Think," in which he calls for a global knowledge network, a device called "Memex" (memory extender), that would serve mankind by organizing, documenting, and retrieving the increasingly growing "cultural record." See Figure 1.

Despite the fact that the Memex was designed to record and display information with now outdated microfilm technology, Bush's invention of "hyperlinking" and associating information nonsequentially formed the basis of hypermedia, a concept fundamental to today's notion of computer-based multimedia. Bush envisioned Memex users as information trailblazers, searching through the nation's libraries, government records, and university knowledge base—growing exponentially at a frightening rate—to create threads of linked associations for future generations of researchers and scholars.

#### Art, technology, and collaboration

Time moves forward to the tumultuous 1960s. Bell Labs engineer Billy Klüver's collaboration with artist Jean Tinguely resulted in the infamous "Homage to New York," the self-destructing machine that blew itself apart in the Sculpture Garden of the New York Museum of Modern Art. Klüver immediately grasped the significance of interdisciplinarity—he introduced the notion that artists and engineers could work as collaborators, each contributing unique and vital knowledge to the creation of the artwork fused with technology.

#### Interactive media

Perhaps more importantly, though, Klüver influenced artist Robert Rauschenberg—one of the key figures in 20th century art. Together, they conspired to bring about a new interactive relationship between the viewer, the artist, and the art object. In Rauschenberg's installation "Soundings" (1968), a 36-foot-long mirror-sculpture responds

to the voice of the viewer, as well as other extraneous sounds including weather and traffic noise. The mirror's imagery is revealed by sound-activated rear lighting, exposing its luminous mural of rotating chairs. Rauschenberg's goal was "to make the viewer responsible for the artwork that he or she sees.... Earlier I was the artist. Now the viewer will make the image, not I."

#### Birth of the personal computer

Some five years later in 1973 at Xerox Palo Alto Research Center (PARC) in California, Alan Kay, a disciple of Vannevar Bush, introduced the graphical user interface (GUI) on the world's first personal computer (Alto) connected to the first local area network (Ethernet). The Alto, a direct descendant of the Memex, held promise for the future of computer-based interactive multimedia, some 30 years after Bush's prophetic article. The Alto synthesized many of the key elements of multimedia discussed above:

- the illusion of immersing the viewer in a graphical representation of the image
- interactive graphics, sound, and text
- authoring systems that facilitate the creation of hypermedia in an interactive environment

In fact, the Alto's operating system, written in SmallTalk, was so user friendly that children could write their own programs. A new interdisciplinary medium for the Gesamtkunstwerk of the future was born.

#### Narrativity

What kind of artistic creations would emerge from this new medium that had evolved for so many years? What sort of stories could be told? One of those who grasped the significance and potential of interactive multimedia was performance artist Laurie Anderson. In 1995 she created the CD-ROM "Puppet Motel," in collaboration with multimedia artist Hsin-Chien Huang. In this work, Anderson translates her theatrical ideas into a new form of storytelling, a narrativity indigenous to the medium. The viewer is immersed in an imaginary world (see Figure 2) where the narrative establishes no linear plot, no set goals, only a free association of vintage Anderson vignettes composed of mysterious environments, bizarre objects, and haunting sounds. The audience is free to roam, play, ponder, and explore.



Image courtesy of Laurie Anderson

**Figure 2.** "Puppet Motel" by Laurie Anderson.



Image courtesy of A. Hegedues, B. Linterman and J. Shaw

**Figure 3.** "conFiguring the CAVE" by Jeffrey Shaw, Agnes Hegedues, and Bernd Linterman.

#### Coming full circle

It's ironic that multimedia, which we tend to associate with advanced technology, is at the same time the oldest form of creative communication. Could the cave dwellers of Lascaux ever have imagined that nearly 20,000 years later artists would be creating immersive, ritualistic performance works for the Cave Automatic Virtual Environment (CAVE) system? The installation "conFiguring the CAVE" (see Figure 3) debuted in 1997 at the InterCommunication Center (ICC) in Tokyo, Japan.

History does indeed have a tendency to repeat itself. MM

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