Here is a flashback to the start of the author's 1999 article on merging rich media technologies.
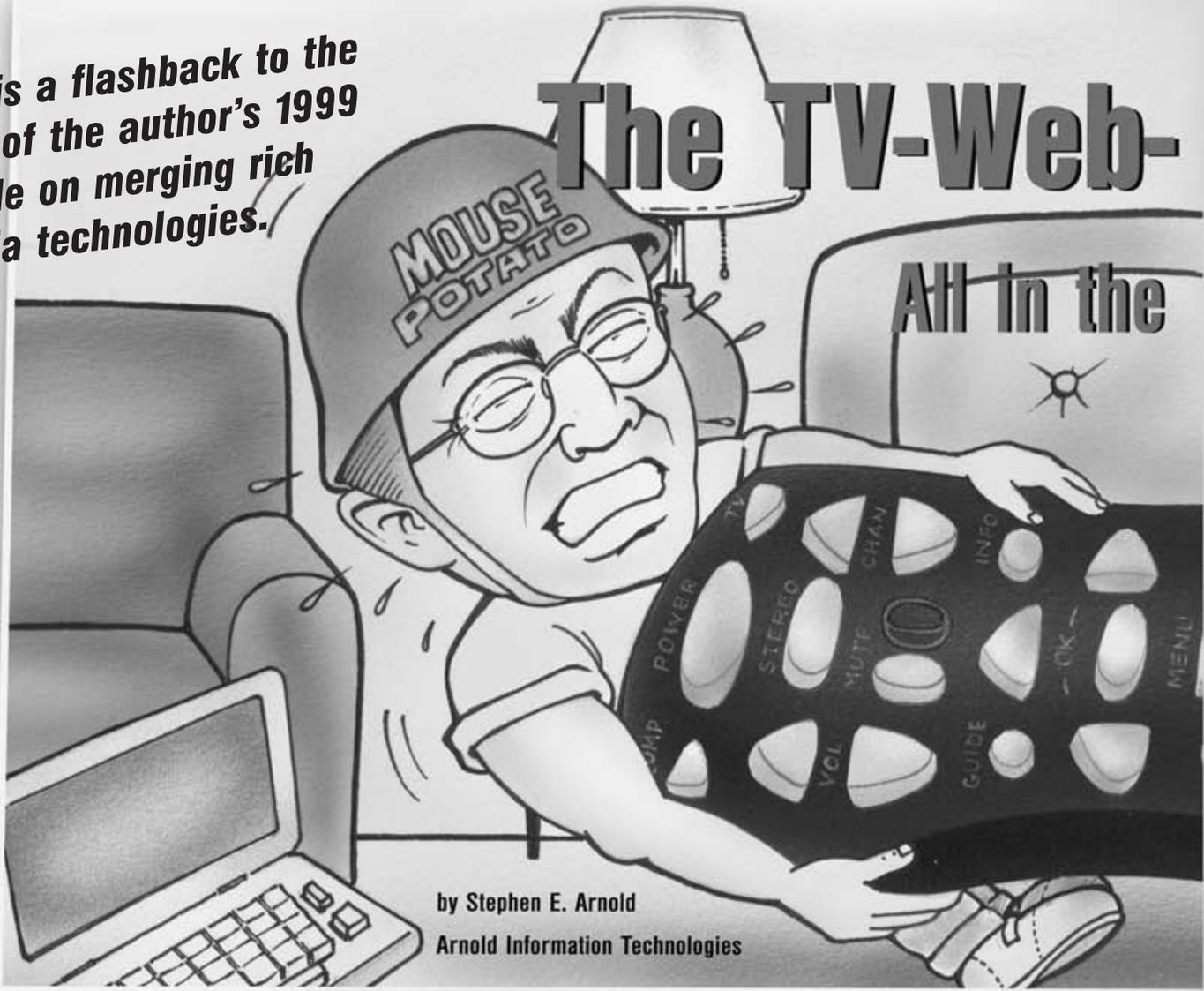
The TV-Web-
All in the

by Stephen E. Arnold
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T he TV landscape is a whale of a "wasteland," bigger than former FCC czar Newton Minnow ever imagined. Broadcast-quality video is ubiquitous. Changing the installed base of traditional television receivers is a big job, but one that will pay off handsomely for the company able to pull it off, particularly with the federal government mandating digital TV as the new standard.

The Internet has begun drifting toward the TV paradigm. Fire up a browser and explore:

- http://www.entertaindom.com, Warner Brothers' newest approach to Net video

- http://www.comedynet.com, comedy drivel for 20-somethings
- http://www.worldcinematv.com, a site from Bravo

The Net is rapidly shifting toward multimedia. From live cameras in college dormitories (ugh!) to *Blair Witch* wannabes, video abounds. And more gigabytes of the stuff are coming fast. The trillion-dollar question is, "Will it come to the family room?"

The Fuzzy and Familiar

Broadcast quality TV is fuzzy and familiar. Most American-type people find watching television from 10 feet away a satisfying experience. But those who watch POT (plain old television) after playing a rock 'em, sock 'em Quake session with 50-amp stereo sound find it like cold oatmeal—bland and mostly awful.

Slamming a net-surfing chunk of plastic and silicon into an Office Depot computer is kid's stuff to a 13-year-old. Getting the garden variety TV to work as an Internet appliance may be a stretch for the average couch potato. The television industry and the personal computer industry are not kissing cousins. Each sees the other as a bunch of carpetbaggers.

Net Appliance:
Family Room?

Scylla! Charybdis! I Want You?

Remember Scylla? Remember Charybdis? Mythological examples of getting stuck between a rock and a hard place. The TV-Web-Net "thing" must address two intractable sets of issues — on one hand, some tough technology problems, on the other hand, equally tough user- and customer-related issues. Both areas of concern demand resolution.

The tables on pages 36 and 38 summarize the digital divide separating the two clusters of challenges before those who want to put the Web on a TV:

What is clear from these two monsters is that technology is the lesser of the two problems. User and customer issues are more storm-tossed. Sony, Microsoft, Philips, Hitachi, and hundreds of other companies must navigate between our two charming friends Scylla and Charybdis. The trip will be a harrowing one.

The television "industry" wants to sell boxes, big ones with screens and awful speakers. Each manufacturer wants to offer different size, shape, and color add-ons. The more pieces a consumer buys for a home entertainment system, the more SKU ("stocking unit") turnover.

The motion picture and entertainment moguls want to "rent" content for one-time use and grudgingly allow one person to make a copy of a song for personal use only. Keep a choke chain on distribution, and keep the cash box full.

Traditional television is a rat's nest of complexity. Byzantine market forces are mirrored in the snarl of cables behind a home entertainment system. The "creative confusion" is intentional. Semi-craziness guarantees serious revenue streams, no matter how tough it is for the person who has to plug a Sony subwoofer into a Panasonic DVD player and get everything to talk to a satellite downlink box without flummoxing Aunt Elsie's videotaping of

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What happens when the clever young teen networks the hybrid device with the Macintosh in the den? What happens when Grandma, bless her heart, presses every button on six device controllers and creates a blue screen covered with Spanish language warning messages? How does dad react when he reaches for a beer and timeshifts a critical field goal in overtime into next week? What happens when an errant game instruction kills the embedded NT software running the system?

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Take a stroll through any Circuit City. What is on display? Big screens loom in the television aisles. Some of these babies are really big, 60 inches with woofers and tweeters driven by amplifiers that would make a low rider proud. The price tags are hefty too. A 60-inch Sony at Frye's in Palo Alto, California, costs $5,999.

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Scylla: Today's Technical Challenges

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Handle seamlessly different video delivery types (standard broadcast, cable, videotape, digital, etc.) via an in-home network.	24-36 months
Reach agreement on a technology platform (Windows NT/CE, Java, other) for the "family room" and another viewer in another room).	36-48 months
Provide seamless coding and decoding of video signals for multi-picture display.	18-24 months
Integrate PC functions with digital/analog video without image latency.	24-36 months
Develop infrastructure for timeshifting[1], agents to handle program recommendations.	12-24 months
Bandwidth to handle interactive, multi-object programs.	12-24 months
Security that satisfies content owners and supports local storage of a broadcast program for personal use.	12-36 months

1 Timeshifting means recording a live broadcast to a hard drive. When the user wants to see the program, it is instantly available. Here's a typical use of timeshifting: The home team is driving for a score. The telephone rings. Punch the timeshift button, take the call, punch the timeshift button when the call is over, and the drive picks up where it left off. Timeshifting can also be similar to taping a show at one time and playing it at another but on steroids.

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The upscale systems boast flat panel (liquid crystal displays) that allow a *Star Wars'* fanatic enough resolution to watch Anakin wrinkle his cute little brow in anguish when his pod racer belches and dies.

Flip the boxes around with the help of a couple of health club aficionados and what does one see? No plugs for a computer. No computer-like rack mounts where plug-and-play devices can nest like silicon pigeons. Tiny holes, weird sockets, and gat-toothed slots abound. The idea is to buy a device from the same manufacturer and pray that firm's DVD, VCR, and subwoofer have a cable to fit the Laurel and Hardy sockets. The implicit warning writ large is: "Buy add-ons from the manufacturer of your set or you will never get anything to work."

Surprise! Computer wizards buy these big screen, LCD, flat panel, HDTV-compatible behemoths. Computer wizards are pretty happy to have a killer TV and home entertainment system in the family room. Presumably the computer stuff sits in another room. Although nice to have, interactivity (PC variety) is not a must when it comes to family room video hardware.

Surprise! The newest video boxes — more like thick room dividers — share features with Roman public architecture. These digital plinths ignite and zap a family room into a home theatre or a private multiplex big-screen cinema. Computers, even when equipped with cards and software to let them do video, come close, but cannot compete against plain old television on steroids. The computer shows some video, but the current crop of digital TVs blasts eardrums and shatters eyeballs with an experience.

Surprise! These six-figure "digital" TV systems are stupid. The push to make them smarter is like a summer breeze, faint and gentle. For the next year or two, the TV combines seem content to mass produce fairly dumb devices. The couch potatoes punch jellybean pads on a bunch of different hand-held devices. The purpose is not

Web surfing. The goal is a family room version of better television.

The final little surprise is the advent of the junk-bond PC. Want a computer? No problem, it is free. The hot new television technology is not free. Whatever credibility the computer industry had has withered in the precipitous price cuts that have led to free PCs. That is one way to jump start a market and drive most of the bean-counters in the television industry into a bomb shelter until sanity returns.

Meanwhile, Microsoft sits patiently with Web TV. AT&T has become a cable television giant. @home shadow boxes with America Online. Each of these new media companies prowls like a pack of wild dogs for a consumer to come along the trail. Big dogs must eat. The question is, "Who's for dinner?" Guess.

Gen X, Y, and Zed: It's "Game Over"

For most college students, high school students, upscale middle school students, and some prodigies in the fourth grade, convergence is history. Game over.

The Internet is this clump of consumers' "television." The "TV" for this group is not in the family room. These Gen X, Y, and Zeds' family room is somewhere in the digital space created by the network. Instead of a footstool and crumpled magazines and a 24-inch TV, it contains:

- Video in archived format (download a chunk of MPG data), real time (participate in one of the dozens of species of video chats), or copy a pirated version of *The Phantom Menace* and crank up the volume on the 50-watt speakers dad bought at the college bookstore).
- Audio, which comes in even more diverse formats and modes
- Electronic mail, instant messaging with and without video, and avatar-based experience sessions
- The standard infinite array of Web content

It is not difficult to envision a parallel TV universe. In one space time continuum are the regular TV watchers. In the other continuum are the "new digital breed." As these cohorts move like lumps through society's esophagus, their progress is hard wired. When they arrive at the fateful time when they outfit their family rooms, the setup will have to deliver audio, video, Internet, and some presentations of content and service that even this aged shaman finds difficult to foresee clearly.

For about 20 million people, the WebTV is the system in the dorm, tucked in a corner of a clothes-strewn bedroom, or crammed on a notebook computer. The convergence of functions will find their way into all manner of devices. Need to plan a recipe? Consult the LCD on the front of the refrigerator. Cell phones will become devices unsafe in the hands of a person over 30. Punch a wrong button, and it will vibrate, log on to a live sex chat service, and order a pizza.

The TV — regardless of how the old guard spiffs them up — won't do the job. The environment will be the assemblage of multiple functions. Watching a show or listening to a radio program is a sub-function.

What's Ahead?

The retail-minded see today's 300 million family rooms as one juicy "replacement" market and expect that by 2004, some type of entertainment center device will be simple enough for those with bottoms rooted to sofas and recliners.

The more interesting market will be the Generation X, Y, and Zeds who will not wait for Circuit City solutions or suffer gladly WebTV functionality. Integration will be pulled into the early adopters' hand-held devices, expensive add-ons, and wireless gizmos for those who want pervasive connectivity now.

For maybe as many as half the Internet users in the U.S., the tiresome

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