

ELECTRONIC IN-HOME INTEGRATION

DAVE WACHOB

JERROLD COMMUNICATIONS

ABSTRACT

The 1990's promise to be an exciting time for the communications' industry, with rapid technical advances supporting a wide variety of new subscriber services. Electronic in-home integration of entertainment, telephony, home automation, control and security, interactivity and data services will all be feasible in the coming decade. CATV is well positioned to provide this integration through expansion of its technology, and the existing sales, installation, billing and support infrastructure. This paper will explore some of the technical, regulatory and historical issues surrounding integration opportunities.

While some of the earlier failures were caused by imperfect technologies, present systems have overcome most of these technical limitations. Human interface issues contributed in part to some of the earlier failures, where system interaction required numerous screens or commands to access the appropriate information or service. Regulators also imposed constraints on other systems and the types of information delivered, hardware manufacturability or return on investment. Commercial viability and market acceptance, however, were most often cited as the major contributor to the success or failure of earlier integration approaches.

DEFINITION

Electronic in-home integration refers to the integration of video, voice, and data to, and in, the residential environment. It includes delivery, control, and support of both conventional CATV entertainment services and non-conventional services such as telephony, home automation, monitoring and control, and data networks. Analog, digital, or hybrid integration of a variety of distributed information systems are all germane to the concept.

BACKGROUND

Historically, attempts at integration have not readily flourished, for a variety of reasons. Systems such as Homenet, CEBus, Smarthouse, Qube, Omnitel, Prodigy, X*Press, Teleaction, Viewtron, Picturephone and others have had varying degrees of success.

ASSUMPTIONS

Video, voice and data will continue to integrate in the 90's, through a diversity of analog, digital or hybrid approaches. Specific implementations, applications and timing will be driven by technical, market, regulatory and commercial forces.

Integration can occur in either the distribution system and / or the residential environment independently or concurrently. Independent integration can occur through a common interface at the subscriber's residence.

Industry integration standards will continue to be refined and accepted as a means to expand the integration worldwide. Two of the more visible standards to be promoted are CEBus and SONET.

MOTIVATION

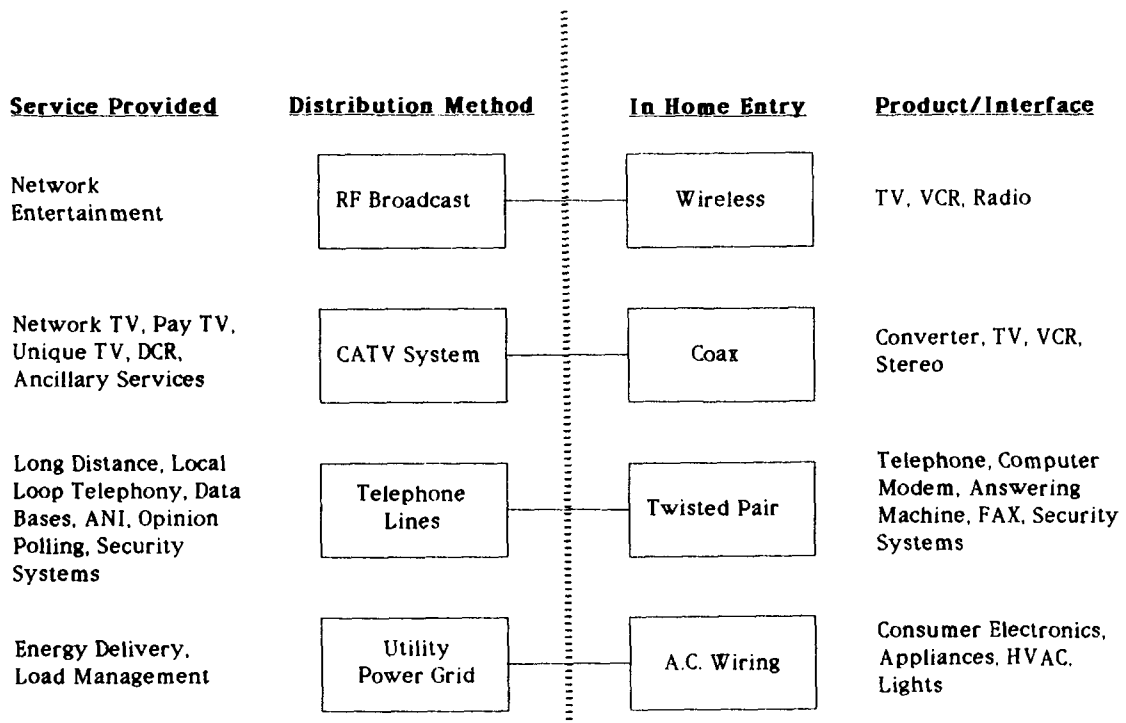
Cable is in a unique position to be an integrated services provider. With over 49 million homes, representing 55% of the TV households already connected, the numbers are projected to grow even further. Growth will occur not only as additional video subscribers are added to the existing base, but also as new non-video services such as digital audio, interactive services, etc. are added. Expansion into PPV will further expand cable's competitive position.

The current cable infrastructure is also well positioned to provide the necessary sales, installation, service and support for electronic in-home integration. Furthermore, the current CATV billing, conditional access and addressable control systems could be easily expanded to include the additional services.

Technically, cable is already delivering first class video signals in state-of-the-art, one-way and two-way cable systems worldwide. This capacity for information transmission and processing, including expansion into 1 GHz and fiber optics technology, provides the foundation for a true wideband information pipeline in and out of the home.

The existing network interface (Figure 1) details the present level of service integration into the home. Currently, the four main information interfaces into the home include the CATV coax, broadcast RF, telephone lines and the utility AC power lines. AC power lines have not generally been considered an information media, but recent applications have indicated their viability for overlaid signal transport.

FIGURE 1
Existing Network Integration

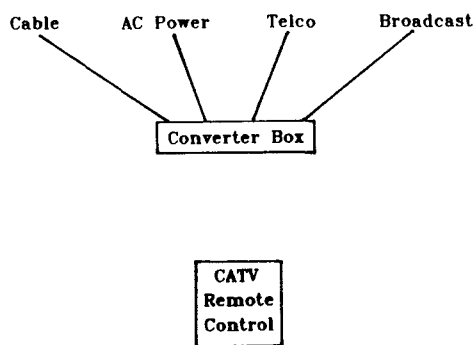


Each distribution method carries information relative to the particular media and interfaces directly with the consumer hardware noted. While there is some degree of interface and information overlap in the home, for the most part they are separate non-integrated media.

The ability to support electronic in-home integration in a cable environment exists now, via addressable converters. As shown in Figure 2, all of the current information distribution systems pass through existing addressable converters. Clearly, coax and AC power are interfaced through conventional connections. With telephone return path modules, the telco phone network is also available. Finally, with the FCC mandated A/B switch, broadcast RF is also accessible. Similar CATV integration would be possible with on / off premise, or multipoint technology.

FIGURE 2

Current Converter Interface

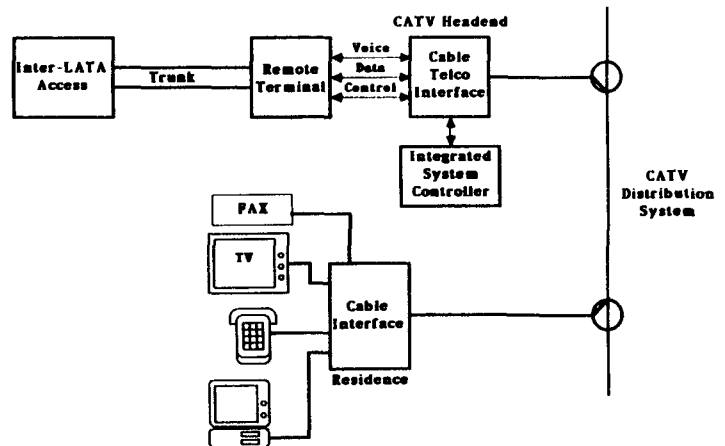


One of the advantages of the common CATV integration points described above includes the use of existing hardware within the device. The addressable receiver, descrambler, micro-processor, memory, remote control, data transmitter and on-screen display capabilities can all be employed to provide integrated services. Interconnection with the existing television also provides a natural vehicle for service selection, display, interaction and feedback.

POSSIBILITIES

Given the above capabilities, some interesting possibilities for integration open up. One concept combines a remote control and cordless telephone, communicating with either the converter or on-premise device. Common components in both the remote control and cordless telephone (keypad, communications path, processor, battery, housing) allow for cost-effective and simple integration. Adding some simple appliance control capabilities (X-10) to the concept would further integrate the concept, and allow for the ultimate "couch potato"!

FIGURE 3



Interconnection to the phone network with the remote control / cordless telephone approach described above could either be through a local residential interconnect, or local loop bypass detailed in Figure 3. In addition to voice, this system would bypass other conventional telephony services, including fax, data base, and security services.

At the other extreme is complete in-home integration as detailed in Figure 4, where all available media are available for communications. This system allows for total integration flexibility, at the expense of complexity and cost. Human interface is also inherently more complex, due to the level of integration provided.

CONCLUSION

Integration of video, voice, and data in the 90's will continue to expand, through a variety of technical approaches and market applications. Complete digital integration is a natural progression of this technology as we move toward the 21st century. Cable, with its technical base, existing infrastructure and strategic beachhead in the home is uniquely positioned to provide this integration, for the upcoming expanded information society.

FIGURE 4

Integrated Home Block Diagram

