1 The Big Picture: An Overview of Digital Signage

> Digital signage has evolved into a highly efficient, appealing means of providing multimedia content for business owners, brand marketers, and advertising agencies, who realize its benefits of informing, promoting, and entertaining specifically targeted consumers. The days of providing static content are behind us.
>
> —Tom Perchinsky, CEO, Adek Corporation

Labor- and material-intensive, static, traditional advertising signage, such as posters and billboards, is being replaced by flat monitor screens and quite-active digital content, often in a network, controlled from nearby or afar, often via the Internet, from any imaginable global location. Non-commercial digital displays offer huge upside potential, as well. Projections of revenue growth in the digital signage industry hit $2.6 billion (yes, billion!) by year-end 2010.[1]

What Is Digital Signage?

For most people, the first key message to understand about digital signage is, just what is it? Indeed, as a technology and as a communications medium, it is so relatively new, undeveloped, and untested, that most both inside and outside the industry of digital signage cannot adequately describe its features and capabilities.

A most simplistic definition of digital signage is that of a "remotely managed digital display, typically tied in with sales, marketing, and advertising."

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1. The Carmel Group, 2007, www.carmelgroup.com.

As is often the case when new technologies develop and are defined, the industries behind the term "digital signage" chose and accepted its name somewhat hastily and conveniently, rather than with the goal of properly capturing the full essence and scope of what this new medium and technology involve. Indeed, it is important to realize that "digital signage" includes monitors that will do much more than deliver mere content representing signage (or commercial) messages. One example includes digital displays used in travel centers to relay travel information.

Nonetheless, the moniker "digital signage" has morphed through the years to become the recognized standard term used to describe the core software and hardware that comprise this dynamic industry sector. Meanwhile, other terms used to describe "digital signage" (or its equivalent) within the industry include, alphabetically, those such as "Advertising Networks," "Captive Audience Networks (CANs)," "Captive Audience TV," "Digital Advertising," "Digital Display," "Digital Media Advertising," "Digital Media Networks," "Digital Messaging," "Digital Point-of-Purchase (POP)," "Digital Signage Broadcasting," "Digital Signage Networks," "Digital Signs," "Dynamic Communications Network," "Dynamic Digital Signage," "Dynamic Display Engagement Media," "Dynamic Out-of-Home," "Dynamic Signage," "Electronic Signage," "In-Store TV," "In-Store TV Networks," "Kiosk System," "Narrowcasting Networks," "Out-of-Home Advertising," "Out-of-Home Media Networks," "Out-of-Home (OOH) Video," "Place-Based Media," "Retail Digital Media," "Retail Media," "Retail Media Networks," and "Screen Media."

That said, the better definition and the one used frequently throughout this work is simply that of "digital signage" (although this book is about more than just commercially based digital signage). This book is really about all of the global digital display media, of which the digital (commercial) signage is a large part, but certainly not all. Indeed, the title of this book, *Digital Signage—Software, Networks, Advertising, and Displays: A Primer for Understanding the Business*, was chosen, in part, to accommodate this concern. To sum up, for the purposes of this book, "digital signage" will refer to both commercial implementations of the technology, as well as all other uses.

Wikipedia defines digital signage as "… a form of OOH advertising in which content and messages displayed on an electronic screen, or digital sign, can be changed without modification to the physical sign, typically with the goal of delivering targeted messages to specific locations at specific times."

FIGURE 1.1 *Digital Signage Can Set the Mood and Provide Information to Its Viewers, Such as in The Lobby of the Cancer Center at the Mayo Clinic (Copyright 2007. Property of the Mayo Clinic. All rights reserved.)*

Yet, as is often the case with Wikipedia entries, the entry falls short of a thorough and accurate academic description of its meaning. For example, the proper definition of digital signage will likely also include in-home applications. Chapter 11 discusses those types of future applications. In addition, the content displayed by digital signage will not be confined to mere advertising messages; instead, noncommercial digital displays, today (and in the future) include (and will include) educational and environment-setting or mood-enhancing messages, to name but a few. A perfect example of a non-commercial digital display is depicted in Figure 1.1. It shows a digital signage display created by the Mayo Clinic, in Rochester, MN, used almost entirely for the purposes of information and mood setting.

Mayo Clinic

Rochester, MN-based Mayo Clinic's system is one of the best known digital signage deployments by a not-for-profit organization. It has been directed for the past half-dozen years by Warren Harmon, whose title is Section Head, Media Production, for Mayo Clinic. The system is planned for and directed to Mayo Clinic's patients and staff. Institutionally, the facility has 30 screens spread throughout 50 Mayo Clinic buildings on the Rochester campus. Plus, there are six "customized projects," each with one to six screens, which occur where a particular unit of the hospital, or administrative supporting department, requests to purchase and operate its own system within the larger system.

When initiated, Mayo Clinic's biggest motivator was the desire to achieve a consistency and timeliness of multiple messages for the staff and patient audiences. Because the staff is so large, so diverse, and so spread out across the Mayo campus, delivering messages in the traditional, static sign way was inefficient and wasteful. Posters were unsafe for patients, hard to manage and coordinate, creating undue clutter and inconsistency of the Mayo Clinic brand, and unduly expensive in light of the value delivered. "Posters on easels just didn't work, people were ignoring the paper. You can meet demands with digital signage, that you can't with paper signage," notes Harmon.

Harmon begins each digital signage implementation in the Mayo Clinic with a formal needs assessment, and on occasion, a pilot test in areas with diverse messaging and audiences. Decisions such as the type of screen for the specific locale are determined, for example, and whether a landscape (horizontal) or portrait (vertical) is the best presentation format. Systemwide choices of either liquid crystal displays (LCD) or plasma are provided, which Harmon has identified as the best for all of the screens that make up the Mayo Clinic digital signage system. Organic light emitting diodes (LEDs) are being considered for the future, due to their ability to display remarkable pictures and to fit into the different Mayo Clinic environments. Content delivered includes photos, text, graphics, charts, and pictures (but no audio). Screen locations include elevator bays, hallways, bus stops, and almost everywhere indoors (especially cafeterias and conference rooms).

A specific example of the appropriateness of digital signage in the Mayo Clinic environment is its use to convey emergency messages, both on a local and national basis. Every monitor tells the audience how to respond in case of emergencies. Harmon offers that, "The digital signage system is designed to manage all components of an emergency situation." Scala and Alpha Video's CastNet system are the software management brains behind the Mayo Clinic digital signage program. And although targeted messaging is used only "occasionally," more is planned for the future. System management is done remotely via the Internet.

Intending to maintain a high level of control and message, Mayo Clinic decided early on to abstain from third-party advertising. Mayo Clinic's main goals are (1) to communicate with patients and employees, (2) to enhance and influence their experience, as well as (3) to convey important and timely messages.

Financially, Mayo Clinic's digital signage program began a handful of years ago with a budget of $200,000, which built a core system of 30 monitors fed by one server via coaxial cable. As digital signage grows at Mayo Clinic in several clinical and administrative areas, average annual costs come to somewhere in the range of $150,000–$200,000. Because the digital signage system was not built with the goal of a

financial profit, but rather for its efficiency and the well-being of its audiences, no clear return on investment (ROI) benchmark was created to prepare for its implementation.

Installation of the Mayo Clinic digital signage system is at times challenging for Harmon and his colleagues. One of the reasons is that installing a monitor into a wall is often the best solution, but that means additional expenses, as well. Other questions involve safety, as well as determinations on how to distribute the signal from the servers to the monitors (e.g., via Ethernet, cable, or coax). Standardization of items, such as which monitors and where they should be placed, created additional challenges, including factors such as a logical deployment and replacement plan.

On the maintenance and service side, Harmon has learned from years of experience that requiring a multi-year service and maintenance agreement is something over which he will not compromise. These minimum 3-year agreements include coordination of training for the new deployment, as well as frequent periodic software updating sessions and on-site service. Message and content creation is put into the hands of the Mayo Clinic's individual department "customers." All content is submitted on scheduled intervals for the specific signage application. Content creation sessions are designed to be browser based and user generated, creating enhanced efficiency and user friendliness for Mayo Clinic staff members.

It is extremely unlikely the Mayo Clinic will drop its digital signage system, but an over-proliferation of screens on the campus, where audiences would not easily distinguish messaging, or if the content were to become irrelevant to audiences over time, might result in removal of the system (or parts thereof). Harmon noted that there is always room to improve the design of the system and how the content furthers the consistency of the Mayo brand (because the Mayo Clinic is such a dynamic, fluid, and ever-changing environment).

Concludes Harmon, "Digital signage is only one of Mayo Clinic's media channels, and is part of our overall corporate communications strategy. Growth potential for digital signage as a strategy in a corporate environment is huge, especially as it relates to overall employee communication and satisfaction."

One of the better known and better versed champions of the recent digital signage movement, Lyle Bunn describes digital signage (which is probably better suited for the readers of this book who wish to acquire an accurate understanding of what digital signage means and what it represents) as "a network of digital, electronic displays that are centrally managed and individually addressable for

display of text, animated or video messages for advertising, information, entertainment, and merchandising to targeted audiences."

Digital signage, as described in this book, shall also include utilizations and content or devices such as flight and train information/screens, corporate communications (e.g., in conference rooms, lobbies, and training facilities), command and control center displays tied to security applications, removable media such as DVDs that are delivered by foot (often termed "sneaker-net" delivery), and specialty channels for specialty audiences, such as those in waiting rooms.

An example of a "typical commercial digital sign"—which, because the majority of digital signs are commercial, also happens to be an example of a "typical digital sign"—is shown in Figure 1.2.

It's Not TV

Also helpful is an understanding of what digital signage is not. Digital signage is not like standard over-the-air broadcast television. Instead, modern-day digital signage typically depends on more than one audio, video, or data file that gets delivered concurrently to a single screen for concurrent display. Yet, free over-the-air broadcast signals can and do typically become one of many parts of a digital display, whether for digital signage or other purposes. Thus, a typical

FIGURE 1.2 *A Typical Commercial Digital Sign at Nike Town in San Francisco (Copyright 2008. Property of Jimmy Schaeffler. All rights reserved.)*

digital display may involve multiple sets of images that are displayed on the same screen at the same time, and broadcast or multichannel TV content may be part of that.

Indeed, digital signage images emanate from numerous sources at the same time, such as a broadcast, cable, or satellite signal, and mix together on the same screen, at the same time, together with photo images, or data, animation, or other video images via signals sent from a computer or server, close by or far away. One of the wonders of digital signage is the pure and unbridled flexibility of the content that can be delivered to the medium. Where TV involves real-time content, the digital signage display features content that can be live (or "real-time"), as well as other content that is not live and is stored somewhere in a form of memory.[2]

Further, although broadcast-oriented TV content is usually created at and delivered from one or more TV stations, the content delivered to digital signs comes concurrently from many different files, and sometimes, many different places. Inasmuch as the audience for TV shows typically finds itself sitting, the same audience for digital signage content tends to be more active and mobile.

And finally, TV involves but one protocol, form, and stream to carry both analog and digital TV, whereas digital signage offers users a great variety of protocol, forms, and displays. Digital signage offers this flexibility and variety primarily via its foundation as a medium built around an Internet Protocol TV (IPTV) format.[3]

Note also that other forms of signage, such as well-lit displays on trucks and at stationary locales that offer transparent scrolling paper or cloth panels, are not examples of digital signage. Scrolling signage like this also tends to be more static and less adaptive to the elements that make digital signage so attractive to today's advertisers, vendors, and audiences: that is, instantly changeable content; in the form of a concurrent display on a single screen of slides, video, animation, audio, and/or scrolling digital data (for example); offered on a single screen or on many screens

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2. Note that in a manner that is purposefully consistent with the sister NAB-Focal Press publication, Lars-Ingemar Lundstrom's *Digital Signage Broadcasting: Broadcasting, Content Management, and Distribution Techniques*, this book also utilizes the terms "real-time," "non-real-time," and "near-real-time," to refer to the different forms of content delivered to a digital display, and their relation to "live" versus "non-live" coverage of places, people, and events.

3. See, Lundstrom, Lars-Ingemar, *Digital Signage Broadcasting: Broadcasting, Content Management, and Distribution Techniques*, published by NAB-Focal Press, for a specific and detailed introduction to each of the technical sides of digital signage.

concurrently; presented on bright and ever-cheaper flat-panel displays; controlled from close by or incredibly afar; via the Internet and IPTV (for example).[4]

The Scope of Digital Signage

Some, if not many, of the cognoscenti who recognize and study its future, predict that digital signage will burgeon to the point where it reaches to every imaginable civilized locale. This will include structures and displays inside and out, both commercial and non-commercial, as well as in homes everywhere. In addition, at no point in the future can they foresee some form of digital signage not being a significant part of our future lives. Rather, the question becomes merely the forms it will take, and the quantity of applications, as well as—and perhaps most importantly—the controls human populations will place on this new industry.

Various business measurements are typically deployed to indicate the predicted future of a new medium. These usually involve things such as units deployed, subscribers, annual revenues, and costs per thousands of consumers reached (CPMs).

The underlying foundation of the digital signage industry is the global advertising industry, which is big and getting bigger. According to the advertising research and intelligence firm TNS Media Intelligence, U.S. ad spending in 2005 delivered an estimated $144 billion. On a global scale, according to the global accounting firm PricewaterhouseCoopers, global advertising spending reached $385 billion in 2005. By 2010, PricewaterhouseCoopers projects that global ad spending will reach half a trillion dollars.

According to Neilsen Monitor-Plus, the total dollar volume of the U.S. outdoor advertising industry in 2006 measured $5+ billion. From another source, Infotrends, the specific 2006 measure of digital signage spending was an estimated $1+ billion. Figure 1.3 shows digital signage (part of outdoor signage) at 3% among the plethora of different advertising types and locales.

The point is that digital signage remains relatively dwarfed compared to spending on cable and network TV, for instance, yet that former figure is ripe for change, as most reading this book will agree.

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4. Not to belabor the obvious, but it is important to note that digital signage is also not the Internet. For example, whereas almost all Internet use by the public is done in what is a fairly intimate and typically private, person-to-monitor space, digital signage is almost always used out in the open by all of the audience that makes up the passing public at the time.

In Figure 1.4, the advertising spending picture is presented yet again through another set of research eyes, this one by Veronis Suhler Stevenson, TNS Media Intelligence Report, Universal McCann, the Outdoor Advertising Association of America, and IAB/PWC. This chart shows the overall estimates of U.S. advertising
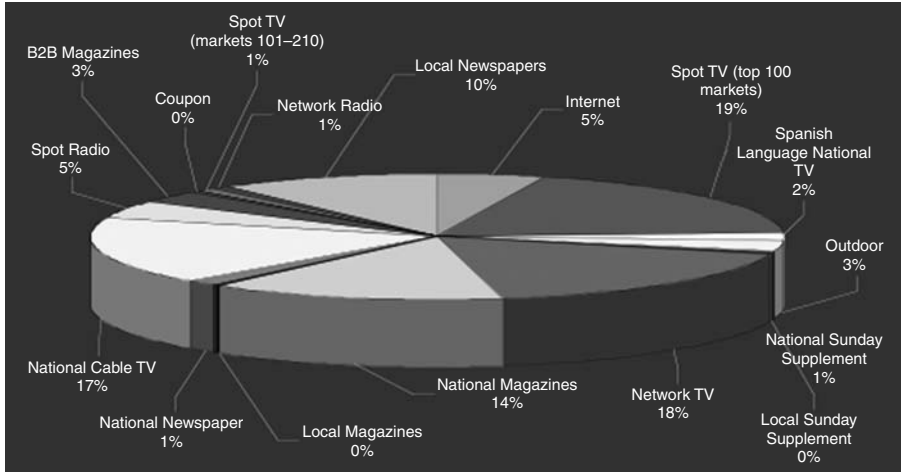

FIGURE 1.3 *2006 Advertising Dollars Indicates Only 3% Spent on All Outdoor Signage, of Which Digital Signage Is an Even Smaller—Yet Quickly Growing—Percentage (Infotrends)*
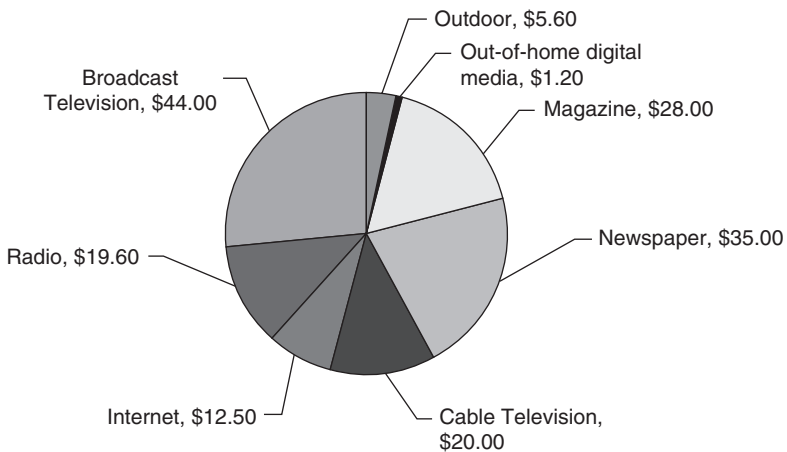

FIGURE 1.4 *2006 U.S. Advertising Spending by Media Type, with a Total of $165 Billion (Veronis Suhler Stevenson, TNS Media Intelligence Report, Universal McCann, the Outdoor Advertising Association of America, and IAB/PWC)*
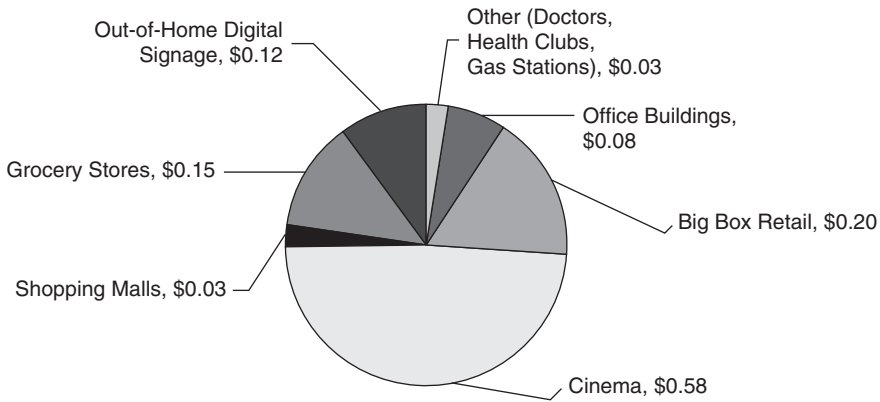
Out-of-Home Digital Signage, $0.12

Other (Doctors, Health Clubs, Gas Stations), $0.03

Office Buildings, $0.08

Grocery Stores, $0.15

Big Box Retail, $0.20

Shopping Malls, $0.03

Cinema, $0.58

FIGURE 1.5 *2006 U.S. Advertising Spending on Out-of-Home Digital Media, with a Total of $1.2 Billion (Veronis Suhler Stevenson, TNS Media Intelligence Report, Universal McCann, the Outdoor Advertising Association of America, and IAB/PWC)*

market size, as well as the breakouts by percentage among the different ad types. Digital signage makes up a relatively small percentage and sum of the OOH digital media market, at $1.2 billion for 2006 (see Figure 1.5), however, that sum in future years is realistically expected to rise exponentially.

New York City-based Arbitron notes a study that found: (1) shoppers are very receptive to retail video via digital signage; (2) as such, retail video tends to stem the tide of commercial avoidance; and (3) retail video reaches consumers at a critical point when they are ready to purchase a product or service. Figure 1.6 further elaborates these phenomena.

While there are many variations in the estimates presented by the various research organizations presented here and elsewhere in this book, the point here is simple: The lucrative and powerful advertising industry recognizes, and thus will drive, the future of digital signage in the U.S. and globally, probably because digital signage works and it will undoubtedly work better in the future. Figure 1.5 helps make this point.

Part of the reason the advertising industry is willing to consider the potential of new media such as digital signage has to do, ironically, with the development of other new media, such as DVRs, MP3s, VOD, and the Internet. For example, a recent study by The Conference Board and YNS indicates that nearly 16% of American households that use the Internet watch television broadcasts online and
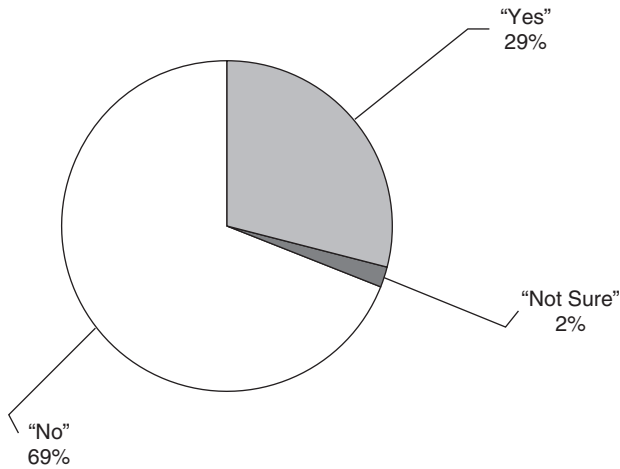
"Yes"
29%

"Not Sure"
2%

"No"
69%

FIGURE 1.6 *Digital Signage Increases the Likelihood of Unplanned Purchases in the Retail Environment—One in Three People Made an Unplanned Purchase After Seeing an Item Featured in a Store's Video Programming (Arbitron)*

that year over year the rate has doubled. The research firms said personal convenience and avoiding commercials were the top two reasons why consumers are flocking to the Internet for video.

Looking solely at the consumer electronics (CE) hardware behind the digital signage movement, the Arlington, VA-based Consumer Electronic Manufacturers' Association of America (CEMA), using data from a study conducted by Isuppli/Stanford Resources, projected that the overall worldwide retail signage market was $501 million in 2003, with a growth projection including a 29% CAGR, growing to $2.35 billion in 2009. 2003 display revenues were comprised of plasma at $310 million with LED video at $156, rear projection at $19, and LCD at $16 million. By 2009, plasma displays are expected to generate $1.14 billion in revenues, followed closely by LCDs at $996 million. In the same year, LED and rear-projection displays are expected to achieve $220 million and $30 million sales, respectively. Figures 1.7 and 1.8 depict an important cross section of this digital signage CE growth.

As further referenced in Chapter 3, some analysts are suggesting that the overall U.S. digital signage industry will produce revenues nearing $2.5 billion by year-end 2010. Pointing toward numbers like these, of the 450,000 billboards around the country, about 500 are digital, and all have been erected within the past 2 years or so. Hundreds more are planned to go up in 2008, according to the
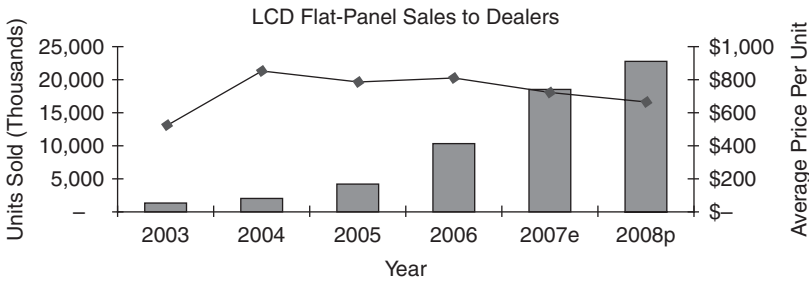
FIGURE 1.7 *The Actual and Expected Growth of Flat-Panel Plasma Screens for 2003–2008 (Consumer Electronic Manufacturers' Association. Used with permission.)*
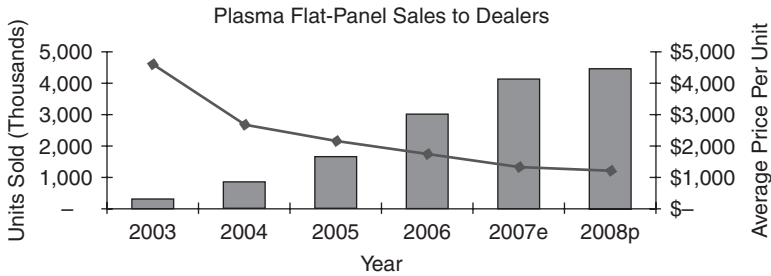

FIGURE 1.8 *The Growth of Actual and Estimated Sales to Electronics Dealers of the Other Major Digital Signage Screen Format (i.e., LCD, for 2003–2008) (Consumer Electronic Manufacturers' Association. Used with permission.)*

Outdoor Advertising Association of America, the outdoor advertising industry's Washington, DC, lobby group.

On another level of measurement, examples of digital signage networks include estimates of Wal-Mart's 75,000 displays, McDonald's 43,000 displays, and CompUSA's 8,240 screens in 103 stores, with as many as 80 screens per store in some locations.

Core Opportunities and Challenges

As detailed in Chapter 3, there are a great number of opportunities and a handful of critical challenges ahead for the digital signage industry.

Key among the challenges are education, unrealistic expectations, costs, finding appropriate business models, and the relative newness of the digital signage medium.

Key among the opportunities are some of the same things that we label above as "challenges." Thus, there is true opportunity in educating business and consumers about, finding ways to lower the costs of, finding appropriate business models for, and exploiting the newness and uncharted territories that make up today's (and tomorrow's) digital signage world.

Digital Signage Today

Digital signage can be found in the following key locales, especially ones where there is a so-called "captive" (or waiting) audience:

- Malls
  - Kiosks
  - Information displays
- At retail
  - Supermarkets, department and drug stores
  - Gas stations, convenience stores
- Streets, freeways (i.e., billboards)
- Trade shows
- Cinemas, theaters
- Hotel and motel lobbies
- Vehicles
  - Busses, taxis, and airplanes
- Travel centers
  - Customer terminals
  - Airports, subways, and train stations
  - Elevators (and waiting areas in front of elevators)
- Stadiums and arenas
- Public buildings and places

- – Hospitals

- – DMVs

- – Public authorities

- – Municipal crossroads

- Houses of worship

- Amusement parks

- Gambling and gaming centers

- Restaurants

- Banks

- Health facilities

  - – Salons, health spas

  - – Doctors', veterinarians', and dentists' offices

- Factories and manufacturing

- Any place selling digital screens should be using digital signage (and use inventory on the floor in the form of digital signage).

Future locales for digital signage are also worth noting in this section because, as noted in Chapter 11, many are being experimented with today, and some beta tests are ongoing to bring them into more and more places. These include:

- in car navigation systems (huge need tied-in appropriately with use by the consumer);

- in clocks at the airport (few have it; every gate needs one; they should be ad-sponsored, including a discreet, relevant, and changeable advertisement);

- just imagine it (but do deploy it correctly, so that the audience enjoys, is and helped by, and appreciates the message).

Purposes of Digital Signage

Digital signage can today be used to deliver content that falls primarily into four distinct (but often overlapping) forms: commercial, informational, experiential, and behavioral.

Commercial

There is little doubt that commercial versions of digital signage are the most important part of the phenomenon. This is, in large measure, because this is the side of the industry where the money resides. Furthermore, commercial utilizations of digital signage are an answer to the rather chaotic environment advertisers and their patrons find themselves in as they enter a new century. The reasons for this chaos are tied to consumers' abilities (and desire) to turn off or ignore ads, together with the lack of relevant or meaningful advertising content to address their consumption needs.

Several key forms of digital signage will lead the pack of future commercial uses. First will be the traditional form of product or service sales. Second will be the implementation of brand and image introduction and enhancement. Another will be tied in with behavioral digital signage, where, as noted in greater detail later, potential customers will be encouraged to go into a retail outlet or stay longer and spend more money.

Informational

From Paris, France, to Shanghai, China, travel center usage of digital signage and displays has proliferated in recent years. As airports upgrade to place themselves more in the forefront of modern-day travel, installation of large and vivid digital displays is becoming quite commonplace. To date, most of these displays are limited to mere flight information and data, however, future displays recommend the possibility to tie in directly with commercial, behavioral, and experiential usages as well.

Another example is the wait-queue for international travelers entering a new country and preparing for an interview with a local customs agent. This is a unique chance to inform the visitor, in his or her language, of the why, who, and how of immigration, thus easing the visitor's or new resident's anxiety and helping him or her to better assist and communicate with the customs representative. In short, the proper implementation of digital display in this environment helps each party to do the job better.

Another ideal example is a waiting room of a medical facility, where patients are introduced to various medical products and services via digital displays. Chapters 2 and 9 offer case studies where these digital signage systems in medical facility waiting rooms are operating successfully.

Experiential

Picture a medical clinic or doctor's office where patients are waiting to be examined. Nerves and anxiety are high, and time passes slowly. Typically, much of the worry is driven by an acute lack of information about what malady afflicts, and how it can be treated.

In this scenario, new digital signage services such as Baby-TV and emebaVet, have been introduced. Another example, as indicated in Figure 1.9, is the Mayo Clinic digital display system, which actively deploys digital signage for use by its doctors, nurses, and related staff members, as well as its thousands of annual patients. In each of these instances, there is a sincere effort being made by the business owner, content provider, and operator to put the patient and his or her loved ones at ease, to inform them about their condition, and/or to help them pass the otherwise difficult time waiting for service.

Another example would be digital signage placed in hospitality centers, such as hotels, spas, and restaurants. Like hospitals and veterinarians' offices, digital signage content affects perceived waiting time. As importantly, content messages provide anything from recipes and descriptions of meals served to public service announcements; to information on health center treatments, products, and other services; to information about various visitors' attractions from the hotel concierge. Indeed, as is true of so many present-day applications of digital display,
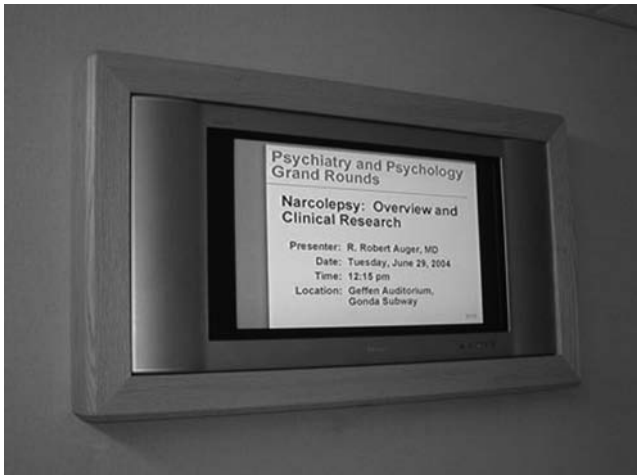

FIGURE 1.9 *An Example of a Typical Mayo Clinic Digital Poster in Rochester, MN, That Informs Employees and Patients (Copyright 2007. Property of Mayo Clinic. All rights reserved. Used with permission.)*

these examples scratch the surface of what can and will be displayed in the future. Chapter 11 will more completely address these possibilities.

Behavioral

At a convenience store, a bank, or a post office facility, for example, customers either wait in line or wait for the completion of their service. In these types of situations, consumers are, in essence, part of a "captive audience." Indeed, absent something such as a form of digital signage, they either do nothing, get aggravated waiting, or wile away the time daydreaming, or checking a personal digital assistant or cell phone.

A well-positioned and well-presented digital sign, with first rate content that is relevant and stimulating, can serve not only to pass the time, but as importantly, to also engage other products or services in, nearby, or at another similar facility. Thus, a bank patron might be encouraged to activate an automatic payroll check deposit service, rather than wait in line every other week. Or a post office patron might be encouraged to use a lobby machine to weigh his or her package himself and then use a credit card to pay for the postage, place the postage himself on his parcel, and place the parcel in the pick-up bin. And a gas station-convenience store customer can be conveniently addressed while pumping his or her gas, given important information about weather, stock markets, and other relevant content, and motivated to go inside to buy certain convenience store products because of certain offers or sales.

Screens or Displays

Understanding the "big picture" of digital signage also requires a basic understanding of the basic types of screens (or display devices), where the content is shown, and how the consumer receives and reacts to the on-screen message. These devices are another part of the package that is driving this industry's new-found success. One thing they all have in common is a compact form, usually meaning the screen or display is much, much thinner than old-style cathode-ray TV sets, and thus able to be cost-effectively, conveniently, and attractively displayed in a huge range of locales. Digital signage is also working because of its ability to be displayed in a large range of screen sizes, from huge arena screens to the smallest of 1.5 inch by 1.75 inch personal digital assistants. Also importantly, digital signage is working because the screens provide such high-definition quality resolution. The author advises spending the time to investigate and understand and/or hiring someone who does, to get a proper handle on the proper implementation of quality and acceptable performing digital signage hardware.

> For a more complete review of the technical specifics of these types of screens, readers are recommended to see chapter two of Lars-Ingemar Lundstrom's NAB/Focal Press book, *Digital Signage Broadcasting: Broadcasting, Content Management, and Distribution Techniques*.

Scrolling Message Boards

Scrolling message boards, also known as Betabrite screens (see Figure 1.10), are the type seen in modern movie theaters, where the data delivered on-screen is usually displayed in a moving fashion right to left or vice versa, or up and down, in a single color (typically red on a black background), in anything from a near-static positioning to a constant movement.

Plasma Displays

As is true for television screens, in digital signage, for screens larger than 42 inches (107 cm) in width, plasma flat-screen monitors are the acceptable norm. Because of their contrast capabilities, plasma screens are ideal for retail environments.

FIGURE 1.10 *A Scrolling Message Board Advertising Off-Track Betting at the Monterey, CA, Fairgrounds (Copyright 2008. Property of Jimmy Schaeffler. All rights reserved.)*

LCDs

For screens smaller than 40 inches (102 cm), LCDs are flat-screen monitors that have contrast ratios that are not quite as good as those of plasma screens, which should be a consideration when making screen choices. Conversely, obtaining high-level resolution is an easier chore using a LCD than it is using a plasma screen. In addition, LCDs may also include a class of screens called thin film transistor (TFT) LCDs, often used with computers, and can offer "touch screen"-type interactivity, which most other types of screens cannot.

LED Displays

LEDs are based on the principle that light is emitted in certain organic compounds when electrons and electron holes (the lack of electrons) are joined. Today, LEDs are used primarily in very small displays like mobile phones, MP3 players, and digital cameras. There are, however, prototypes for up to 40-inch TV displays. LCDs and plasmas will likely face tough competition from LEDs in the next few years.

Electronic Billboards

The only large screens that can truly handle harsh outdoor temperatures outside are LEDs, however, they are big consumers of electricity. LED techniques are also used for smaller digital signs, such as for text messages on busses, at railway stations, and in airports. Figure 1.11 shows an electronic billboard in use in California.

Projection Screens

Two main types of projector screens, LCD and digital light processing (DLP), highlight the technology behind these kinds of digital displays. Typically, projection systems are most suited for cinema- or theater-like environments. Nonetheless, newer technology is permitting the application of projection screens in retail and public environments. Projection screens are also a relatively cheap way to conduct a digital signage project, although they do require a place to house the projector and a wall on which the image can be projected.

Round Screens and Images on Windows

A few other types of digital signage screens are in development or already entering the market. For example, companies like German-based Litefest are rolling out

round screen, kiosk-like, 2- or 3-foot diameter free-standing round screens, such as the one shown in Figure 1.12. These are being deployed in places like malls and airports, especially where high visibility is important and floor space is at a premium. Moreover, some today are discussing the concept of digital signage in the

FIGURE 1.11 *A Large Electronic Billboard on a California Freeway (Copyright 2007. Property of Clear Channel Outdoor. All rights reserved. Used with permission.)*

FIGURE 1.12 *A New, Narrow, Round, and Tall Kiosk-Like Digital Signage Application (Copyright 2008. Property of Jimmy Schaeffler. All rights reserved.)*

form of an entire side of a large, high-rise building, every window of which would make up part of the total screen. Cities like New York, Chicago, and Tokyo are expected to be ideal candidates for major unveilings of these types of mass-image digital signage.

Electronic Paper

Electronic paper (also known as e-paper) is another form of digital signage technology, one that tries to duplicate the look of regular ink on paper, yet reflects light-like ordinary paper and is capable of holding text and images indefinitely without drawing electricity. It will also allow the image to be changed later. Unlike traditional digital displays, e-paper can be bent or crumpled like regular paper, making it ideal for certain applications. It is lightweight, durable, and very flexible, compared with other display technologies.

Self-Illuminating Digital Paper

E-paper should not be confused with digital paper. Digital paper is also called interactive paper, in large measure because it can be used together with a digital pen, allowing the user to create handwritten digital documents. The digital pen acts to store the handwriting or other creations and then upload them to a computer.

Hardware Infrastructure

Beyond the displays, probably the next most important piece of practical hardware supporting a digital signage and display system is the server. Many simpler systems use basic personal computers or laptop computers as servers. They collect, store, arrange, and display the multilayered content and present it for delivery to the screen. Yet, recognizing a PC's or laptop's processing and storage limitations, many more sophisticated digital signage networks are deploying larger and more capable dedicated servers. These are complex computers that have the size, storage, and capability to do many things on a single screen at one time—or to do the same thing or something different on many screens at the same time, often in dozens, scores, hundreds, thousands, or tens of thousands of screens scattered around the world.

Additional hardware pieces typically include those on the receiver side, and those of the transmit side. On the receiver side, a single digital signage display is comprised of the display device itself, the server/player, and any applicable wiring (unless wireless antennas are deployed, which isn't always the case given the

questions about the quality delivery of video via wireless), and either a digital subscriber line (DSL) router or satellite antenna. Some businesses, such as theaters, also deploy additional servers, often called "side" or "edge" servers, which are often used to store advertisement files.

On the transmit side, a network operations center (NOC) and a content management server (for software control and monitoring) are typically involved. Some of the more advanced satellite delivery systems use multicasting, which would include a multicasting server and IP encapsulator. On the "extremely low-tech" side of digital signage, a DVD player might also be termed a form of digital signage hardware, even if it includes the even lower-tech form of DVD distribution and delivery, that is, "sneaker-net" (or foot) delivery of the DVDs to the digital signage locale.

Content

Some would rather call the "software" side of digital signage the "creative" side. This is because the content or software is where the greatest range of long-term creativity arises. Indeed, the importance of this side of the business cannot be underestimated. On the software side of digital displays, specific details include on-screen content, planning and scheduling, content security, proof of playback, dynamic screen zones, and network control, as well as applications software.

The on-screen content on digital signage devices is typically quite varied, which is another reason the medium is flourishing. In addition to audio and video signals from over-the-air broadcast television, cable, Direct Broadcast Satellite (DBS), and telephone company video (telco), Internet streaming and IPTV are the basis for the content that populates today's digital signage and display devices. These signals will typically fill up just one section of a device (or screen), which is usually called a region, a zone, or a ticker. Other content shown concurrently on other zones, regions, or the like include still pictures, PowerPoint slides, animation, and other forms of full-motion video.

In short, the sky becomes the limit when it comes to the creative uses of different types of moving and moveable content being shown at the same time on different parts of the screens and displays that make up the digital signage world. Indeed, some new advertising and retail commercial entities are moving to create content presentations that are more like their own in-house or in-store custom networks. A typical list or "log" of content will include multiple images shown concurrently, involving still photos, animation, live video (both real-time and

non-real-time), and varied audio feeds, all aiming to educate, entertain, inform, modify behavior, and send an appropriate advertising message to a unique, identifiable, and typically mobile audience.

Worth also including in a listing of basic software is the proprietary middleware that operates programs and makes the content work on screen, and the content files that end up being actually displayed on the digital display (or screen). Select server and media player software is also a very important part of this middleware. More and more people in the digital signage world are calling middleware the "software control system," to better describe its functioning.

Interestingly, the recent introduction of digital signage software that is provided free of charge to the end user might well increase the number of potential digital sign users. Free software makes much more attractive the economics of digital signage. This is especially the case with small businesses and non-commercial digital sign users, such as educational institutions, hospitals, and churches.

Distribution

Three key methods of distribution are behind the content delivered to today's digital signage networks and devices.

First is the traditional wireline form of distribution. This form includes wires from cable, telco, and Internet service providers (ISPs), whose wires and signals are delivered to a server and then relayed further by wires to a user. It also includes specially installed wiring, for example, that done for an in-office computer system, such as a local area network (LAN).

Second is the terrestrial wireless distribution form. This is the form used by cell phones.

Third is the delivery of content via satellites. Companies such as HughesNet and Convergent (today owned by Technicolor, a subsidiary of French-owned Thomson) offer systems and services that employ the use of satellites positioned anywhere from hundreds to tens of thousands of miles above the earth. These satellites serve as relay stations for data starting at one point in a region on earth and coming back down into another point in the same (or another) region or "footprint."

Whatever the distribution form, one strength that digital signage holds from a vendor point of view is the ability of certain retail or other outlets to send content simultaneously to one or to literally tens of thousands of locations. Figure 1.13 provides a Nielsen example of 11 of the U.S.'s largest retailers and where their

FIGURE 1.13 *Retail Networks Offer Massive Coverage of the Entire U.S. (Nielsen. Used with permission.)*

stores are located. Such retailers are ideal for the implementation of large-scale digital signage network operations.

Nonetheless, as noted previously, some digital signage distribution is still stuck in the low-tech days of old distribution of media, such as hand delivery of (or sneaker-netting) DVDs to the digital signage displays within some networks.

Trends Propelling Digital Signage

Wisdom and telecom industry experience suggest it is a matter of when the digital signage revolution truly takes off, rather than if. The future appears that obvious.

Five specific trends point to the rapid development of the global digital signage industry:

(1) The personalization of messages to individual consumers.

(2) The transfer of content from device to device and person to person.

(3) The global deployment of High Definition Television (HDTV) and IPTV.

(4) The enhancement of storage and digital technologies across continents, media, and devices.

(5) The need for enhanced advertising opportunities offered to the world's producers of products and services.

Yet, the changes ahead for broadcasters, multichannel operators, telcos, advertisers, and their allies are hard to estimate when it comes to the combination of technology, software, and hardware that makes up digital signage.

Digital Signage Stakeholders

Absolutely necessary to a clear understanding of the dynamics behind digital signage is the comprehension of the different constituents and, especially, where a newcomer might fit in. Although not entirely inclusive, the list below categorizes the different roles occupied by many of the industry's key stakeholders.

Advertisers

As noted frequently throughout this book, the real driving force behind the development and deployment of global digital signage will be advertisers, many of whom will be driven to deploy digital signage by their advertising clients. Nonetheless, it is critical for today's advertisers to realize how different digital signage is today from traditional advertising, be it the difference between static signage and digital content on digital screens, on one hand, or the difference between a traditional broadcast TV ad and a digital signage ad, on the other.

Network Operators

Network operators are usually businesses that work with location owners and end users to create and manage the core system that delivers the content to the digital signage screens. The network operator is usually capable of supplying everything on the creative (i.e., content) and the technical (i.e., hardware) sides of the digital signage business, although it can also deliver a mere part of the infrastructure and allow the location owner or similarly situated vendor to contract with other vendors for specialized parts or services. A good example of a network operator in this mold is Germantown, MD-based HughesNet, which offers turn-key systems (including content delivery), as well as separate, individual digital signage components.

Plus, the actual operational details, day-to-day and month-to-month, are typically the responsibility of the network operator.

Mobile, Interactive, Touch Screen, and RFID Technology Providers

Mobile, interactive, touch screen, and RFID technology providers might be looked at as the "cutting edge" and sometimes "future" providers of the digital signage world. That is because these are the key areas where digital signage is moving beyond the traditional views of content and hardware delivery. These providers are constantly thinking up new ways to enhance the receptivity and enjoyment of consumers as it relates to the new medium of digital signage. Indeed, as it relates to future trends and converging technologies, these mobile, interactive, touch screen, and RFID technology providers are most likely to pave the way to new digital signage activities and growth.

ISP, Satellite, Cable, Telco, and Wireless Providers

One way or another, each of the ISP, cable, telco, wireless, and satellite (or Very Small Aperture Terminal (VSAT)) providers is a media transport solution. These operators have the backbone infrastructure that allows them to send the signal from point to point and, eventually, to the digital signage or display screen. ISP providers include AOL, Earthlink, and NetZero; cable providers include companies such as Comcast and Time Warner; telco providers are those such as AT&T and Verizon; wireless providers are exemplified by Verizon and Cingular; and satellite providers again include VSAT operators, such as HughesNet and ViaSat.

Ultimately, it becomes their job to transport and distribute the content from place to place. Some in the industry refer to these initial distributors of content as "back end" providers, meaning they are often much further away from the point-of-presence/point-of-purchase near the end user or audience (as it relates to the delivery of the digital signage on-screen content).

Traditional Billboard Companies

These are the companies that should be quite concerned about digital signage, because, already, companies are beginning to replace static, vinyl billboards with large electronic billboards, especially in larger cities like Los Angeles and Las Vegas. In fact, for these companies, the transition suggests a remarkable example

of businesses possibly being left behind and left irrelevant if they do not keep up with emerging trends. In many recent cases, the traditional billboard companies are looking toward digital signage alternatives because of enhanced economic and regulatory hurdles. Chapter 11 features a case study discussing the experiences of an industry-leading outdoor digital signage operator.

Kiosk Providers

Mall walkways for the public are the locations where round, narrow, and tall kiosks are typically found. These are stands incorporating video and audio to inform, entertain, and encourage people to buy products or services or to visit certain mall areas. Increasingly, these kiosks are not only delivering sophisticated digital content, but are also locales where the best in new, two-way interactive customer-to-vendor/advertiser interaction is taking place. Types of interactive screens include touch screens, and screens that interact with credit and smart card operations. Consumers tend to find these types of interactive digital signs more and more helpful and acceptable, especially when the creators do their jobs well. ATMs are yet another example of digital signs that serve people particularly well.

Flat-Panel Display Providers

Once the standard TV screen moved from the days of huge and heavy cathode-ray tube screens to so-called flat-screen displays, the digital signage industry had yet another of its key developmental elements in place. Today, the thin screens are also being termed "flat-panel displays." The technology that goes into these devices is becoming more and more sophisticated and is offering better quality and even slimmer designs. More than any other digital signage hardware item, flat-panel displays are the core hardware item supporting the medium and its recent growth. This is in part because they are the final display device for presentation of the actual content to the viewing audience, and thus have perhaps the greatest effect on the reliability and the quality of the content displayed.

System Contractors

A "system contractor" is typically a company that undertakes a contract to build a digital signage system. These contractors are to be differentiated from network operators, the latter of whom actually handle the day-to-day operations behind the particular functioning digital signage system.

Software Suppliers

There are two types of software suppliers. This book refers to those that create and provide the on-screen video, slides, pictures, animation, and data as the content providers. The other suppliers are those that provide the software control systems, also known to some as middleware providers. These companies that provide the software control systems are referred to by many in the digital signage industry as the "glue that holds the network together."

Store Fixture Providers

These are the companies—typically local and small- to mid-sized companies—whose on-site personnel install and maintain the in-store networks and display devices. Store fixture providers are often hired by system contractors to complete the in-store installation of digital signage deployments.

Digital Printers

Digital printers are those that send digital pictures and billboards via the Internet, offering on-site digital printing services to retailers and the like. Essentially, this service allows shops to print out their own posters or billboards. And like traditional billboard providers, digital printer operations have much to learn from close tracking of the blossoming digital signage industry.

Audio/Visual Professionals

For traditional audio–video rental, service, and installation vendors, digital signage offers an additional new opportunity to broaden their portfolios of services, adding installation and maintenance of digital signage to their list of products and services.

Buyers and Location Owners

Those who pay for and therefore decide to actually implement a new digital signage deployment are typically in this category of buyers and location owners. Nonetheless, as seen clearly in Chapters 6 and 8, these stakeholders also typically do not actually implement all or any of the system themselves, but rather bring in digital signage experts to set it up and do it correctly the first time.

Restaurateurs, Hospitality, and Entertainment

Each of these categories of commercial providers is in a position to dramatically enhance their customers' experience, and generate revenue from partners who want to advertise on their networks. It is important for these vendors to appreciate just how important these two objectives, enhancing customers' experiences and creating revenues, can be toward the achievement of their ultimate business goals. Any location, from a diner, to a small motel, to an amusement park, would be one where its constituents would get a lot out of relevant and helpful digital signage content.

Retailers

Among all the actual and would-be stakeholders, the group of retailers is perhaps the most important single group when it comes to the long-term future and success of the digital signage industry. This is in some measure because, as the old bank robber adage goes, "That's where the money is." Focus for this audience will be on getting proper digital signage deployments to help retailers make money, by cost effectively selling advertising time on their networks, pushing sales, and imprinting their corporate brands in consumers' psyches. Yet this audience must always be cautioned: do it with relevance and sensitivity, and do it right!

Integrators

Different from the ISP, satellite, cable, telco, and wireless providers, the companies that label themselves integrators are tasked with bringing together all of the hardware and software elements and constructing a digital signage network or smaller system. Like the system contractors, these are often local entrepreneurs, although they can also be headquartered far away from various digital signage locales, instead traveling temporarily from site to site for installation.

Banks and Financial Institutions

One of the better known waiting places for modern-day adults is the bank teller line in the local bank. It creates the perfect convergence of an audience that is idle (and perhaps not happy about the wait and thus prime for a mood change) and the opportunity to inform and educate that audience about the bank's or institution's goods and services. Chapters 8 and 10 contain case studies examining this financial environment.

Transportation Hubs

Business people and their families are frequent travelers. As such, few have visited modern airports, bus stations, and train stations—and gas station and convenience stores—without seeing and using a digital sign. These digital signs are used to convey commercial messages and digital displays of visitor entertainment and information. A huge part of the transportation industry's future will be tied to digital signage, and vice versa. Chapter 8 contains a case study reviewing a typical digital signage environment (i.e., an airport).

Costs

As further noted in Chapter 3, "typical" digital signage costs can range widely, dependent on the individual choices made throughout the process on the hardware, software, and even the installation sides of the implementation. Nonetheless, a set of figures from a respected, yet anonymous, vendor shows in Table 1.1 what a conservative outlay of funds might involve in 2008. These expenses are represented relative to one another in the chart in Figure 1.14.

On the content, installation, and maintenance sides of a cost presentation, as noted in more detail in Chapter 3, up-front and longer-term costs vary widely, dependent upon a huge variety of criteria. These criteria include the number of outlets, screens per outlet, sophistication of the files making up the content, the number of files, plus whether a PC or a larger server is utilized, just to name a few.

Single monitor	$1,500/site
Single media server	$1,500/site
Remote installation	$1,500/site
Network terminal	$2,000/site
Network services	$40/site/month
Digital signage services	$50/site/month
Remote maintenance	$45/site/month
Content creation fees	$20,000/month

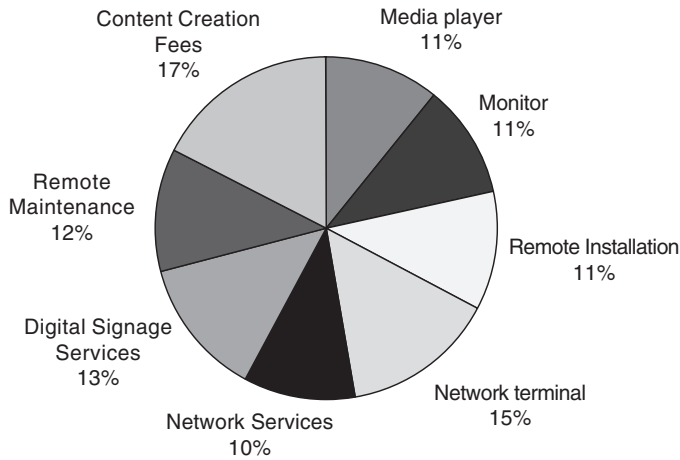**TABLE 1.1** *Typical Digital Signage Costs*

FIGURE 1.14 *A Percentage Breakdown of Total Costs for a "Typical" Digital Signage Deployment*

Consumer Receptivity

Regardless of which research and measurement company conducts the data gathering, Arbitron or Nielsen, both indicate that consumer receptivity to quality digital signage is surprisingly high. As Figure 1.15 shows, theater viewers prefer digital signage in the form of cinema ads to the mere re-airing of TV ads in the same theaters. Moreover, almost two-thirds of moviegoers in the Arbitron study recited solid recall of digital signage ads presented before a movie. One in five of all moviegoers state they are more interested in a product or service after they see it featured on a movie screen. More than half of consumers believe it is acceptable to show ads before a movie, a number that is even higher than the 46% who feel it is acceptable to show ads on television; 36% surveyed felt it was acceptable to show ads before movies presented at home on DVD, 18% on the Internet, and 18% by way of embedded ads in video games.

From a slightly different vantage point, the New York City-based Nielsen organization summarized 30 studies observing the digital signage receptivity of large audiences. Nielsen found that these audiences presented two key attributes as they relate to digital signage in general, nationwide. First, respondents stated that digital signage enhanced their visit and made it more enjoyable. Second, they opined that digital signage was a good thing for the site to offer. Put another way, four out of five surveyed reacted positively and less than one out of ten were notably negative.

Nonetheless, key players in the future growth of digital signage will be required to be diligent and careful so as to not upset or alienate one particularly
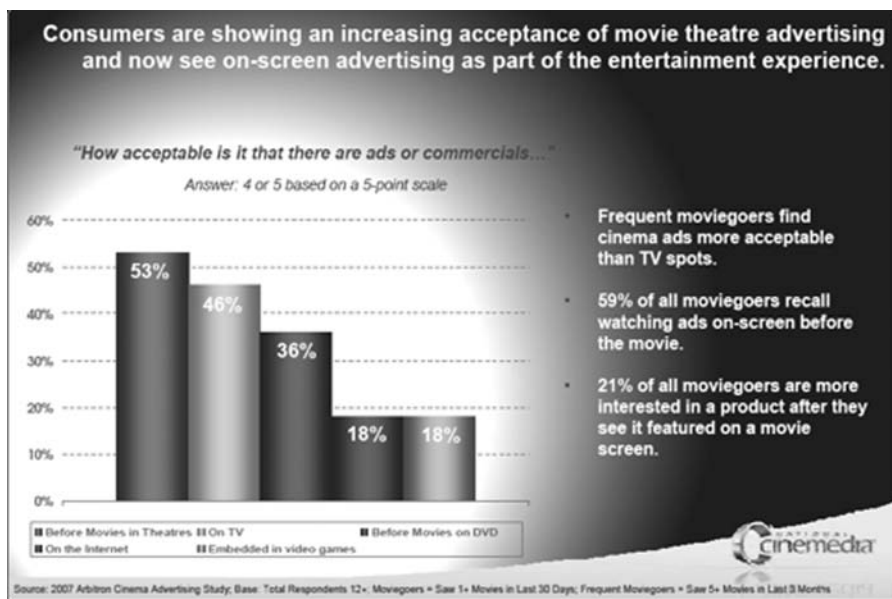
FIGURE 1.15 *An Arbitron Measurement Shows That a Theater Audience's Receptivity to Digital Signage Is High*

important audience: the consumer. If future digital signage applications turn out to be cluttered, intrusive, and insensitive to various audiences' needs, large numbers and percentages of people will be turned off by the new medium. At that point, one of any medium's best sales tools—word of mouth—will instead become its worst enemy. When significant numbers of people begin talking badly about a new product, service, or application, this often dispels its most rapid demise.

Two more studies, both at retail, one by a respected measurement and testing service, Arbitron, and another by a European-based advertising placement company, JC Decaux, pin-point additional causes for consumer receptivity; in short, digital signage is effective. The data from the 2005 Arbitron study and from the 2006 JC Decaux survey is summarized as follows.

2005 Arbitron Retail Study

Over 1,400 U.S. shoppers who viewed digital signage at U.S. malls on the east and west coasts indicated in response to the digital signage experience:

- 40% of them were more likely to make a purchase in stores using digital signage.

- They were 1.56 more times likely to recall a retailer's advertising spot and then make a purchase.

- They added up to seven times the sales lift overall for retailers who used digital signage to boost new-item introductions.

- 81% of the shoppers recalled content that focused on merchandise available in the store.

- 47% of them recalled learning about specials or sales.

- 72% of them in the 18–34-year-old demographic noted they were interested in the digital signage element of music videos playing while they shopped.

2006 JC Decaux/TescoTV Study

The United Kingdom's TescoTV supplier, JC Decaux, conducted research in Tesco supermarket stores, which was made available in March 2006. The study used special camera equipment to track the eye and head movements of 75 shoppers over a 3-week period. The TescoTV Network consists of 100 stores, with 50 screens in each:

- 85% of shoppers looked at a digital screen while shopping at Tesco.

- The average customer passed by 20 screens per visit, actually looking at eight of them.

- Each screen had a 40% chance of being seen, which is equal to the exposure of an outdoor, six-poster advertisement as measured by the U.K. company, Postar.

The Future of Digital Signage

Just looking at the current list of "future digital signage devices" does a lot to excite the imaginations of many observers. That's because things like RFID can be wedded to digital signage in a way that enables digital displays to instantly recognize the identity of a person approaching a digital sign. Then the sign "reacts" to the person by displaying content that is unique and relevant to that individual or the group he or she is in. Moreover, newly developed scanning devices can read a bar code or other message on a name badge or PDA and react by sending that same content to the individual's PDA for storage and later use.

For example, a digital sign might display a message in or near New York City's Times Square, advertising a product such as a premium tied to a certain brand (e.g., M&M candies). The audience member can then walk to the screen somewhere on the street; wave his/her PDA across the message transfer or communication point; have the information/content transferred to the PDA; and later download information on how to easily buy that premium online, often with the push of just a few buttons or a few clicks of a mouse. Or some kind of coupon for future submission might be offered. That is an idea of where digital signage is headed in the future. Figure 1.16 shows a huge 30-foot by 50-foot digital sign in New York City (seen through a second-story restaurant window).

Chapter 11 gives a more complete and detailed listing and description of future digital signage opportunities and applications. The two case studies in this chapter, the first one in a not-for-profit environment, the second, below, in a commercial context (and focused on the actual delivery of the all-important content to the digital signage screen), give the reader an excellent view to actual digital signage implementations, their challenges, realities, and additional views to the future.

FIGURE 1.16 *A Huge Digital Sign in Front of the M&M Mars Candy Store at the Corner of Broadway and 46th in New York City (Copyright 2008. Property of Jimmy Schaeffler. All rights reserved.)*

AccuWeather

AccuWeather, the State College, PA-headquartered entity that describes itself as the "world's leading commercial weather" information company and that also describes itself as a "content provider for digital signage," also focuses on providing value-added services for its digital signage clients, primarily in the areas of merchandising and advertising. There is a high demand for weather information, and that demand was the major motivator behind AccuWeather's launch into its digital signage business. Mike Welsh, the company's Director of Digital Signage Sales, notes "Weather information ranks as the top reason viewers choose a local TV newscast. It is also one of the most-read sections of a newspaper, one of the top three reasons listeners choose a radio station, and one of the most accessed forms of content on the Internet and mobile (wireless) web. What is more, the intense audience interest in weather enhances the value of advertising avails adjacent to it. Weather will play the same role in the next new medium—digital signage." Figure 1.17 shows the AccuWeather content on a typical digital signage display, this one located at an airport in Syracuse, New York.

FIGURE 1.17 *An AccuWeather Digital Sign, Focused on Local Weather, in the Lobby Area of an Airport in the Upstate New York Area (Copyright 2007. Property to AccuWeather. All rights reserved. Used with permission.)*

Welsh notes the significant growth the company is experiencing in its partner and customer base, as the digital signage market takes off. AccuWeather began its foray into

digital signage following an in-depth analysis of the state of the industry, growth projections, potential market, competition, sales potential, and what it felt was the required investment to optimize its content and delivery service in the realm of digital signage.

Today, AccuWeather judges the effectiveness of its deployed digital signage content by how engaging it is for that audience. In short, the message from AccuWeather is that effective content needs to be visually appealing to audiences, as well as relevant—the audience's content has to be local, up to date, and reliable.

AccuWeather employs a business model that leaves the advertising potential to its customers (i.e., the ones that actually host the digital signs). AccuWeather itself does not sell advertising in the content it delivers. Instead, AccuWeather empowers its client users to attract the audiences—to their screens and to their advertising—via AccuWeather's content, which AccuWeather commits to make accurate, detailed, local, and always visually appealing. In the end, this model works in a fashion similar to network television: TV viewers tune in to the evening news, for example, and are teased through commercials with the promise of more weather details. Similarly, AccuWeather's digital signage partners use weather to hold viewers' attention to their advertising or the messaging that they provide.

The content AccuWeather currently offers is focused on its most popular weather content pieces. These include genres entitled "Current Conditions," "Today/Tonight/Tomorrow," "5-Day Forecast," "Hour-by-Hour Forecast," "National and Regional High-Resolution Doppler Radar" (with 15 minute updates), and "Presenter Lead Video Forecasts" (i.e., the top 115 DMAs in North America, 2×/day). Additionally, AccuWeather brings weather-related health indices to the industry, such as arthritis, asthma, migraine, pollen, air quality, UV index, and cold and flu. The network also provides news from The Associated Press, including sports, business, entertainment, U.S., the world, health, and science/technology.

Because the AccuWeather service involves content only, the company does not provide any software-based scheduling mechanisms for day parting. Instead, this capability is provided by its partners. AccuWeather has supported weather-targeted advertising on other media for many years, and many of its digital signage customers are currently using sky conditions, temperature thresholds, or health indices as a trigger for particular ads or messages. Examples of weather-triggered advertising in which AccuWeather has participated include links between the weather and products, such as clothing, beverages, and food, as well as more subtle examples, including advertisements for vacation locations shown during inclement weather.

Looking specifically at the weather content, AccuWeather's proprietary "Forecast Engine" produces weather data for 2.7 million points globally. Examples of the range of forecasts provided include the 24/7 comprehensive forecasts produced for all 43,000 U.S. zip codes, all 750,000 Canadian postal codes, and a collection of 40,000 non-U.S. cities. Delivery of AccuWeather content comes via HTTP Web service or File Transfer Protocol (FTP). In most cases, the AccuWeather content is delivered or served to a central server at the reseller's location. The players controlling the individual signs in the field are directed to ping the reseller central server, which forward the AccuWeather data to the player.

AccuWeather supports all major digital signage platforms, including a very wide range of content management software and hardware players. Its content is offered in a number of file types (e.g., XML, PNG, and SWF), which provides optimal solutions for each platform. AccuWeather's business model involves it receiving "cash for [its] content," and AccuWeather leaves the advertising discussion to its customers and their customers.

Some applications, such as hotel lobby digital signage, may incorporate AccuWeather's "Today/Tonight/Tomorrow" forecast as an amenity to guests, to help them better prepare for their business/pleasure in a city away from home. However, AccuWeather's content is most commonly used to attract attention to accompanying advertising content. Finally, although brand awareness is welcomed, most of AccuWeather's customers prefer to incorporate the AccuWeather.com brand as a source of authority, accuracy, and reliability in weather forecasting. The value in the exposure of the AccuWeather brand is an ancillary and welcome bonus.

AccuWeather states that it believes the digital business is poised for significant growth, as additional users of signage come to appreciate the value of weather content in attracting audiences. Early on, when considering moving into the digital signage content realm, AccuWeather created a targeted ROI plan before its initial deployment. The biggest obstacle to further digital signage content deployment is largely a function of the roll-out schedules of the company's customers. "This market is happening, and we're prepared for the demand," claims Welsh. The only question is how soon things will really take off.

Surprisingly, AccuWeather notes little negative reaction to AccuWeather's digital signage content deployment in public/outdoor locations. In all cases of feedback, its partners receive unsolicited praise for bringing to a captive, and sometimes bored, audience content that they want to see and can benefit from. AccuWeather's partner, Transit TV, has conducted impact studies of deployed, outdoor digital signage. The research provides statistics about people who depend on service for their news and weather, as well as information about the retention of commercials that air after the AccuWeather weather segment (see http://www.transitv.com/research.html, for specific details of this research).