

The Evolution of Digital Signage

Executive Summary

Throughout history, there have been numerous technological advances that reshape the way people communicate and interact with information. We are in the midst of one such advance - the development and acceptance of digital signage. By combining the capabilities of computer graphics, broadband access and flat panel display technologies, digital signage is becoming more prevalent as a communications resource for forward-thinking companies.

As with any nascent technology there is a large amount of interest, which is often accompanied by excessive hype and overpromises fed by advocates, opportunists and zealots. Some of it is well-intentioned enthusiasm for bettering our lot in life. But it also creates clutter in the marketplace and often has the unintended consequence of keeping people from moving forward and embracing the change.

In order to provide some guidance on the real promise of this technology, this paper looks to historic examples from other technological breakthroughs to explain the short- and longer-term ramifications of the current state of digital signage. The basic premise is that there are three phases of evolution within technology advances, each with its own set of priorities, issues, competitors and customers. Once identified, the characteristics of each phase can set expectations and provide direction to people looking to implement a digital signage communications strategy.

Three phases of evolution

When looking at the societal acceptance of new mass communications technologies, three phases become apparent:

Phase 1: focus on infrastructure

Phase 2: focus on content

Phase 3: focus on context

Understanding which phase a new technology is in provides a framework for considering realistic expectations, which strategies to consider and when to begin adoption. For this discussion, we will examine a couple of recent advances - the telephony industry and the Internet.

Historic examples

Telephony's first focus was infrastructure. Hardware was the primary industrial driver as lines, poles, telephones and switches were manufactured and installed. Growing the industry into a widespread communications medium required that a physical presence be in place. So the major players were the builders and suppliers of the hard assets, and remained that way well into the second half of the 20th century.

Once the infrastructure was embedded and coverage was universal, the industry entered phase 2 of its evolution. People now had the ability to communicate instantly, but it was expensive due to the cost of recovering the phase 1 infrastructure build-out. Content became the driver for phase 2, as the industry now needed people to use the infrastructure in order to continue growing. Users became



conditioned to the costs and associated an importance to the incident of a 'phone call' to the point that calls were scheduled and duration governed around billing rates (weekends or Sundays). Pavlovian conditioning or not, the phone call inserted itself as a priority event that people responded to, but they did it without context - .i.e., automatically answering calls from an anonymous caller just because the phone was ringing. Once costs were driven down through the increased use of the infrastructure, consumers started using the phone more casually. Businesses saw an inexpensive opportunity to reach a large number of consumers and developed telemarketing programs.

But as with any action, there is a reaction that is not always planned. People became annoyed with the false alarms - answering unwanted phone calls at dinner, interrupting conversations for sales pitches or getting prank calls from juveniles. What was missing from the incoming phone call was the context around it. This was solved by the introduction of new technologies such as caller ID, ushering in Phase 3 of the evolution. Now the event of the phone call and the call's content had some context to it. Caller ID let users know if a call was important or frivolous and put personal relevance around the content that the medium was providing. Additional advances such as answering machines and voice mail also provide context for the call's content, allowing users to gain control over the event, which is the final step in the evolution of technology to mass acceptance.

Another example of this three-phased evolution is the rise of the internet industry. When the National Science Foundation created network access points for commercial companies in 1995, they opened the web to the world. Within a few short years, telecommunications firms had created a backbone for national and regional internet service providers (ISPs) to connect. Dial up connections were soon replaced by high speed networks and routers evolved to allow multiple users to share an address. Phase 1, developing the infrastructure for the Internet happened very quickly and continues to grow exponentially.

As the infrastructure was taking off, phase 2 kicked in with the introduction of Mosaic and people started creating websites. This innovation made the industry focus less on bandwidth and more on content. Of course, the accompanying hype helped foment the dotcom bubble and reinforced that while the potential of the internet was seemingly unlimited, it took more than just a website to create a business. However, the content focus remained strong as the survivors began to see advantages for commerce and communications in the web. After several years of maturing, the internet became a huge content and data cloud but was in danger of becoming too amorphous.

The web of old was a compilation of static screens with little relation to the people viewing them. The advent of Web 2.0, phase 3 of this evolution changed all that, suddenly the web shifted from a repository of information to an information delivery mechanism based on the viewer, not the author. The web now had context and adoption accelerated dramatically spawning new companies and changing the way we do business. One beneficiary of this transformation was Google, whose search engine provided contextual search and its by-product, personal relevance to information. Web 2.0 created a rich user experience that is both dynamic and participatory. It launched a broad array of new services such as RSS feeds, wiki's and blogs. The enriched context now available from the internet's immense data warehouse has put users in control of what they want to see, and the internet is now the distribution channel of choice.

A new phase for Digital Signage

In each of these recent examples, one can see that communications media have followed a similar evolution from focusing on infrastructure through content to context. It is an interesting exercise to apply this perspective to digital signage, the newest mass communications medium, and use it as a guide for better implementations and strategy.

Although the use of video screens for consumer-facing information purposes has recently become pervasive, the actual digital signage industry has a long history that goes back to stock exchanges, call center queues and other less public uses. The early driver for the industry was hardware-focused, even evidenced by the industry's name, digital signage. The big players were the display manufacturers, and the barriers to entry were physical limitations of size, graphical performance, readability, reliability and particularly cost. As flat panel displays became more readily available, market growth was boosted by minimizing these previous barriers. Sales were made on the promise of what might become available from the content side, and installations grew dramatically, especially in consumer-facing locations. Many networks targeted advertisers with the promise of a fourth screen to access specific demographic groups. Forward-thinking companies started embracing the cost advantages of digital signage versus printed menu boards, etc. and consumers began to appreciate and expect it

Because the supply of original content was minimal, many sites began filling their displays with content from other media such as print, web and television. In many cases, this information was inappropriate; a digital signage message must be more concise than a 30 second television spot. Many early digital signage networks were stuck in the same phase 2 limitations of the Internet. Just because you have content on a screen does not mean that anyone has to look at it. In order to make the content more inviting, many sites began augmenting their content by tapping into customized feeds from data providers for news and weather information. This was a good start towards providing greater value to the viewer but was still a very broad stroke and did not engage specific viewers with targeted messages. Some network operators tried to develop multiple channels to segment content to viewers based on time of day (a practice known as "day parting") and location but this is still very coarse segmentation. The problem with phase 2 strategies is that they presume that people will watch what you push out regardless of relevance to them.

Like the unidentified phone calls of Telephony's phase 2, if too much information is irrelevant viewers will soon tire of the displays and their effectiveness is ultimately compromised. That situation has now occurred with digital signage, creating a public backlash about the intrusiveness of ads or other information that is irrelevant to them which ultimately will dampen the rate of acceptance.

Content creation and its management became such key phase 2 issues that many display providers are either partnering with software providers or dabbling in software development to provide 'solutions' rather than screens. They realize that the residual value is in the application of the hardware. This is the current state of the industry. But the industry like the telephone and internet, now finds itself entering a consumer centric phase 3.

Since no new communications medium exists in a vacuum, user experiences from existing media can impact expectations of new ones. As a result, viewers now expect context and control over messages - they get it from their DVRs, cell phones and internet access - and they will want it when they encounter digital messages in public. With digital signage, this puts a premium on attaching context to the messages so that they are more relevant to the viewer. Just like Caller ID with telephony and Google on the internet, context is the next big issue for the industry to resolve. And context is not one-dimensional - it can be environmental, geographic, ethnic or generational - and ultimately it becomes personal. This creates a mass communication paradox - signage owners want to reach a broad base of viewers, but the viewers want individualized messages.

So far, the phase 2 approach has been to address the issue by building playlists that are scheduled in advance and have some capability for localization. These are predominantly time-driven, not data-driven, and are not capable of real-time adjustments. But there are new solutions just entering the market that provide context in content based on binding parameters to multiple data sources. These solutions make the information more relevant to the viewer and therefore more effective. For example, a sports arena can adjust menu choices automatically based on the combination of weather conditions, curfew considerations, event attendee demographics and internal inventory levels in order

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to optimize both the time a person spends making a decision and the resultant sales. This data might include input from the viewer through interactive displays, cameras or product identification devices such as RFID tags or bar codes.

A successful phase 3 implementation realizes that the content (format, emphasis and graphics) is enhanced by the context (data) to optimize the installation's usefulness.

Without becoming too Orwellian, it is possible to use face recognition and other contextual data to dynamically change messages to suit a particular audience. The resultant dynamic playlist is created for a momentary audience and provides more relevance and therefore more valuable information. Most facial recognition installations today, use the information they gather to measure audience demographics for general content scheduling, they don't integrate the data into the playlist on the fly.

Many network operators define their networks in course terms such as doctor's offices or department store checkout lines. A gas pump does not know the age, income or sex of the person who is filling up their car. The challenge and value of adopting a phase 3 approach to digital signage networks is the ability to aggregate demographic groups but it requires a shift from a content focus to a viewer experience.

The outcome of this paper is not to paint what-if scenarios; rather it is to learn from previous technologies and make some considered predictions about digital signage. As the evidence suggests, the industry is already migrating away from a hardware-focus and even basic content to a need for intelligent content - contextual content that leverages the efficiency inherent in the technology. Companies considering the investment in a signage network need to think past the here-and-now of the installation and envision what improvements and efficiencies can come from putting intelligence into the equation.

By thinking of digital signage as a communications tool, it becomes easier to realize that there are many ways to extract value from an installation that transcends the display component. Placing intelligence at the point of display or POS allows users to capture relevant product data, customer interactions and other events that impact the marketplace environment. The feedback loop created from a contextually-empowered intelligent system provides a quicker ROI from direct and indirect sources.

As previously seen, the transition from content to context is a natural phase in industrial evolution, so any company looking to upgrade their current signage situation now should acknowledge that fact and not restrict their current decisions to content-only display systems. Content might be king, but if you overlook the importance of a context-driven solution, then you most likely will paint yourself into a corner.

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