DIGITAL SIGNAGE
FUTURE TRENDS
## 2019

CONTENTS

EXECUTIVE SUMMARY

We are entering the last year of the 2010s, and staying on top of the digital signage market is more important than ever. By purchasing this report, you are gaining a key advantage in the never-ending quest to see what's on the horizon for technology.

When it comes to digital signage, the displays aren't just getting bigger, brighter and thinner, they are also getting significantly smarter. End users can use digital signage to deliver experiences, not simply push information. Vendors are increasingly offering more advanced analytics packages, which can measure an audience's reactions and respond with tailored content.

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editor,
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Bradley Cooper is a technology editor for Digital Signage Today and former editor of Kiosk Marketplace and Virtual Currency Today. He has a background in information technology, advertising and writing.

With all these trends, it can be a real challenge to know what you should focus on so you don't fall behind. This report is designed to help ease that burden by offering key survey data on how end users are interacting with digital signage. It also provides a variety of perspectives on future trends, offered by experts in the industry.

The experts provide predictions on digital signage in every vertical, including retail, QSR, corporate communications and more. Some of their predictions include:

- An increasing integration of facial analytics and touchscreen technology.
- More robust hardware to handle security issues.
- More digital signage deployments in "smart cities."
- Mini/micro LEDs to deliver better resolutions.
- More schools embracing digital signage.
- More flexible designs.
- More integration with tracking technology.

Thank you for purchasing the Digital Signage Future Trends Report. For more information on digital signage trends, make sure to subscribe to Digital Signage Today and stay tuned for our other reports, such as the Digital Signage Software Comparison Guide.

SURVEY RESULTS

Note: Not all data will equal 100% due to rounding

1. Where is your company headquartered?

Other includes: Brazil, Argentina, Dominican Republic, South Korea

Other
4%

Canada
6%

United States
57%

Latin America
5%

Europe
10%

Asia
13%

Middle East
2%

Africa
2%

Australia/New Zealand
1%
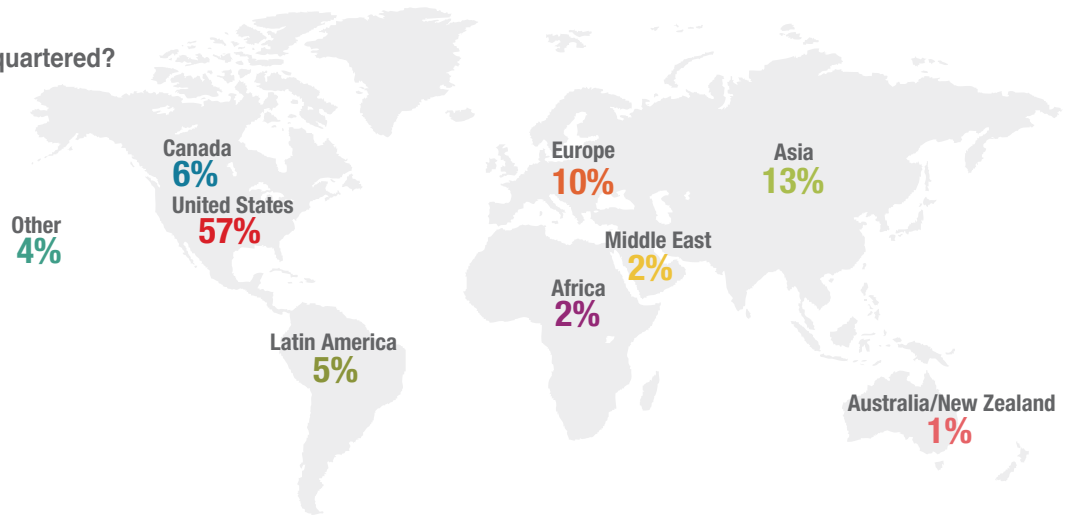
2. How would you describe you or your company/institution/agency?
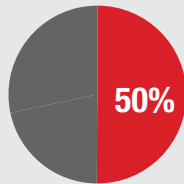
50%
A digital signage solution (hardware, software, services) provider
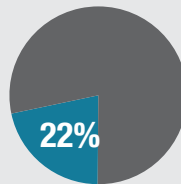
22%
A digital signage end-user/deployer
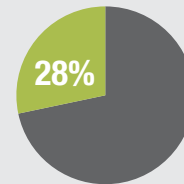
28%
A potential digital signage end-user

3. Which of the following best describes your company/organization?

Other includes: public relations agency, consulting firm, public school district, and airline.

Other
25%

Restaurant/
Foodservices
Provider
18%

Bank/Financial
Institution
16%

Retailer
8%
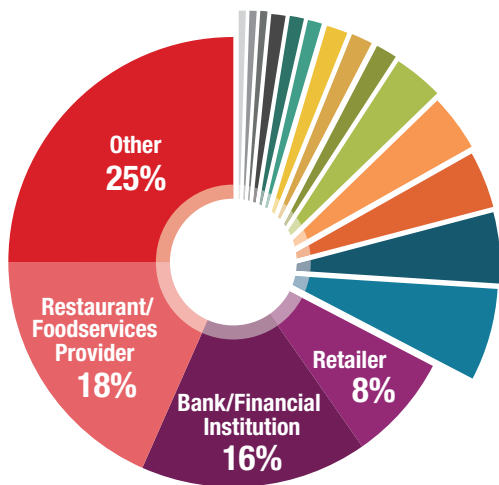
- 1% Casino
- 1% Digital Out-Of-Home Advertising Aggregator
- 1% Pharmacy
- 1% Hotel/Resort
- 1% Medicinal/Recreational Cannabis Dispensary
- 1% Stadium/Arena Operator
- 2% Digital Billboard Owner
- 2% Grocery/Supermarket
- 2% Health Care Facility
- 4% Non-profit agency
- 4% College/University
- 4% Government/Public Sector Agency
- 5% Digital Out-Of-Home Advertising Network Operator
- 7% Advertising Agency

4. Do you currently employ digital signage or digital menu boards?

Yes
61%

No
39%

5. How do you use digital signage?

Participants selected all that applied

95%	**50%**	**32%**	**27%**	**23%**
In-store digital menu boards	Point-of-wait promotional displays	Drive-thru digital menu boards	Point-of-purchase/order confirmation displays	Outdoor promotion boards
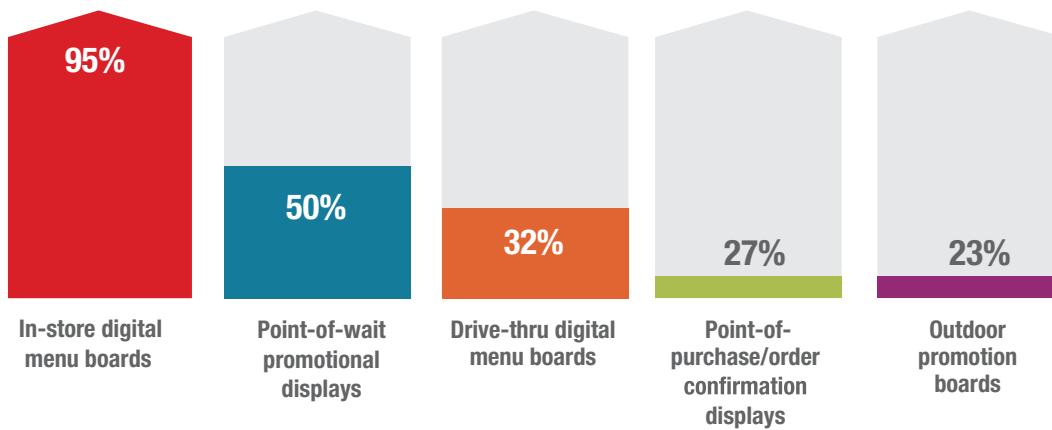
6. If you have multiple locations, where have you deployed digital signage?

Don't have multiple locations
14%

Most locations
36%

All locations
18%

A few pilot locations
32%
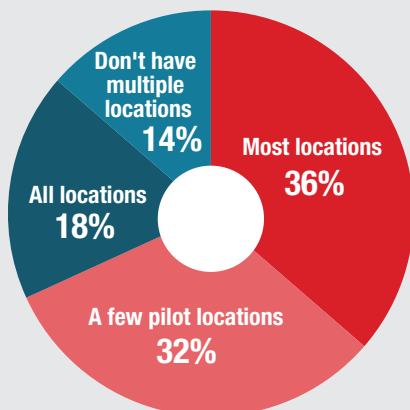
7. If you have deployed to some of your multiple locations, do you plan to deploy to more locations?

No.
13%

Yes, all.
33%

Yes, some.
54%
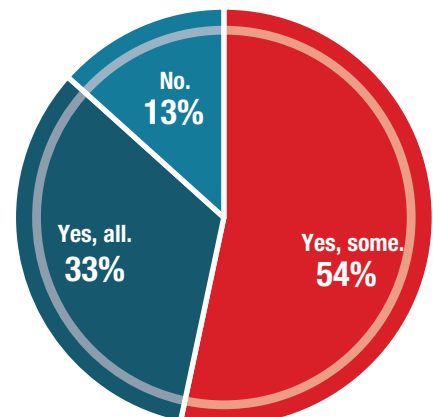
8. How important would you rate the benefits of digital signage in your restaurant?

5 = Very important   4 = Somewhat important   3 = Not very important   2 = Not important at all   1 = Not certain

Benefit	Rating
Increased traffic	2.19
Keeping up with advances in dining room ambience	2.18
Improved employee training	2.14
Increased overall sales lift	1.95
Reduced spending on static printing	1.91
Compliance with federal, state or local menu-labeling regulations	1.90
Increased profit margins overall	1.82
Increased sales of high-margin items	1.82

9. Do you plan to deploy digital signage in your location(s)?

Yes
47%

No
14%

Not sure
11%

Investigating the possibility
28%

10. And if so, how soon?

Not sure
23%

Within the next 6 months
32%

Within the next two years
16%

Within the next year
29%
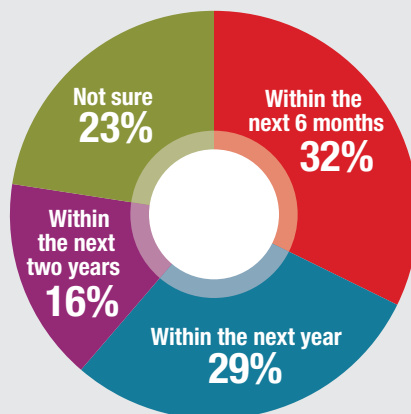
11. Do you currently use digital signage or digital out-of-home advertising to promote your clients?

No
42%

Yes
58%
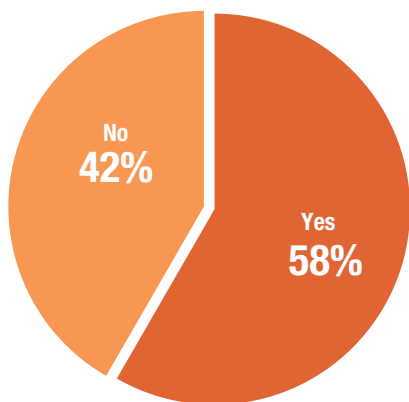
12. How do you anticipate your use of digital signage to change in the next two years?

Stay the same
25%

Increase
75%
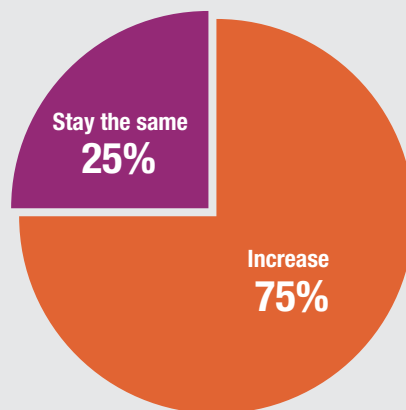
13. Do you see digital signage as better or most useful for:

Participants selected all that applied

5 = Very important   4 = Somewhat important   3 = Not very important   2 = Not important at all   1 = Not certain

2.08
One-off promotional opportunities

1.42
Promoting sales lift and cross-sell opportunities

1.42
Branding and Ambience

1.33
Issuing a call to action

1.18
Product Advertising
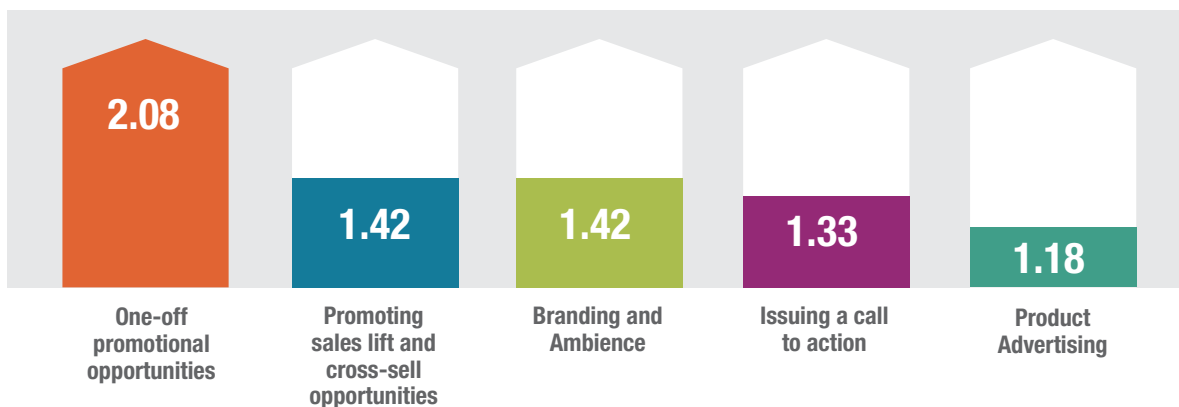
14. Do you currently spend on digital out-of-home advertising networks?

50%
Yes
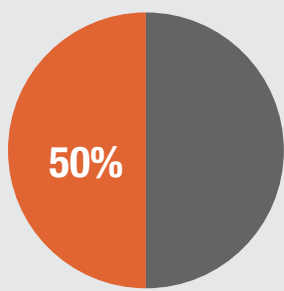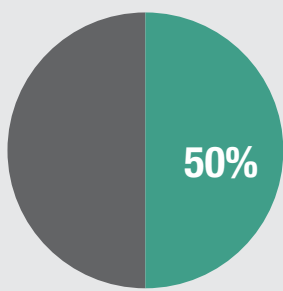
50%
No

15. How do you anticipate your spending on digital out-of-home networks to change in the next two years?

Stay the same?
33%

Increase?
67%
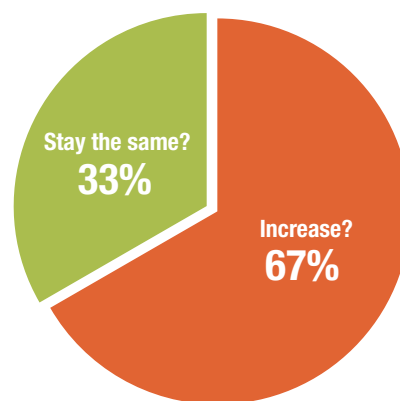
16. What is the size of your institution?

13%	13%	13%	63%
Fewer than 1,000 students	Between 2,001 and 5,000 students	Between 5,0001 and 10,000 students	More than 20,000 students

17. Does your institution currently employ digital signage?

87% Yes

13% No
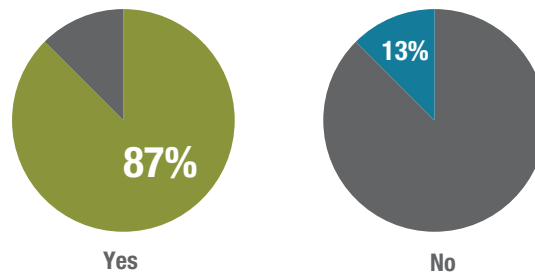
18. For which applications/uses did you deploy digital signage?

Participants selected all that applied
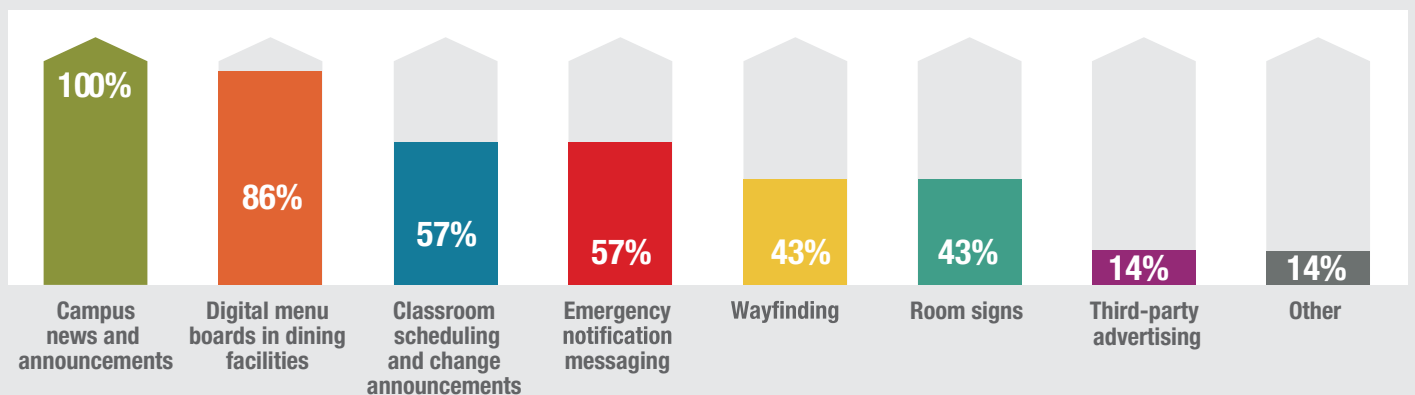
100%	86%	57%	57%	43%	43%	14%	14%
Campus news and announcements	Digital menu boards in dining facilities	Classroom scheduling and change announcements	Emergency notification messaging	Wayfinding	Room signs	Third-party advertising	Other

20. Do you have one or multiple locations?

67% Multiple

33% One
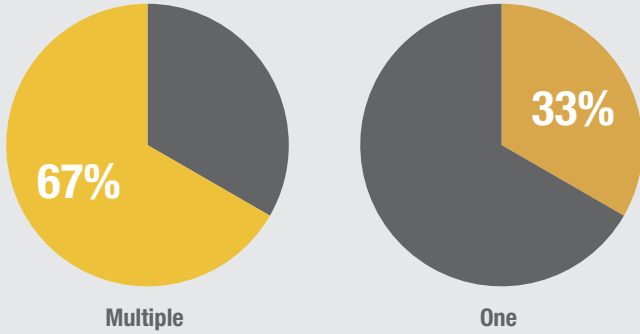
21. Have you deployed, or are you planning to deploy, digital signage to your location?

Not certain
20%

No, have not deployed
20%

Not planning to deploy
20%

Planning to deploy
40%

22. If you haven't but plan to, how soon do you plan to deploy?

Within next 6 months
20%

Within the next year
20%

Within next 2 years
20%

Not deploying
40%
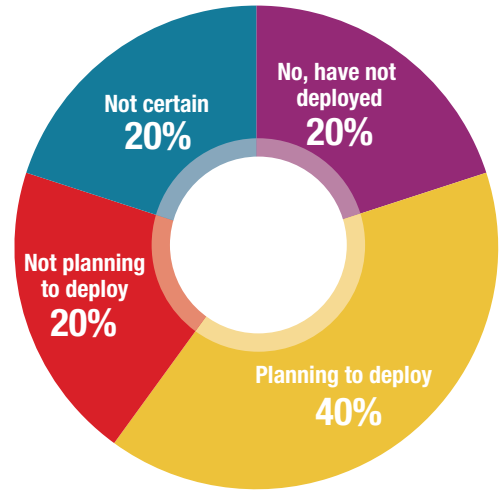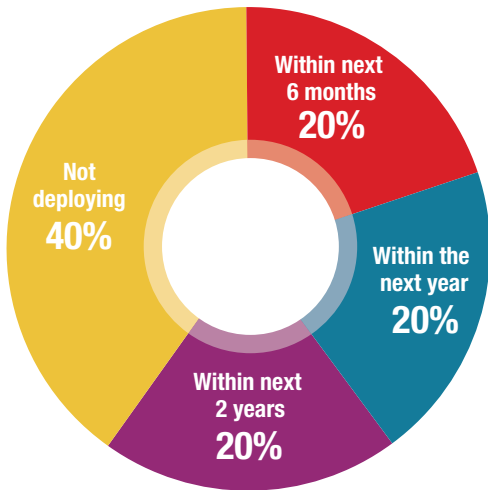
23. Have you deployed digital signage to some or all of your locations?
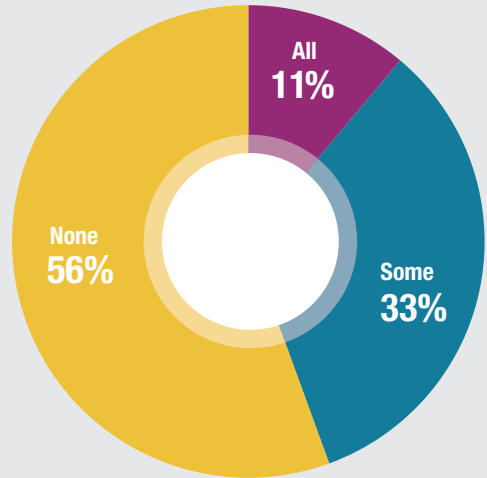
All
11%

Some
33%

None
56%

24. If you haven't but plan to, how soon do you plan to deploy?

Within the next 6 months
22%

Within the next year
22%

Within the next 2 years
34%

Not certain
22%

25. How would you rate the utility of integrating or potentially integrating the following technologies with your retail digital signage?

4 = Very useful　　3 = Somewhat useful　　2 = Not useful　　1 = Don't know

Technology	Rating
Gamification	**2.67**
4K	**2.22**
Gesture interactivity	**2.22**
Mobile or smartphone integration via NFC	**2.22**
Mobile or smartphone integration via SMS	**2.00**
Social media integration	**1.89** (Facebook, Twitter, Instagram, etc.)
Touch interactivity	**1.89**
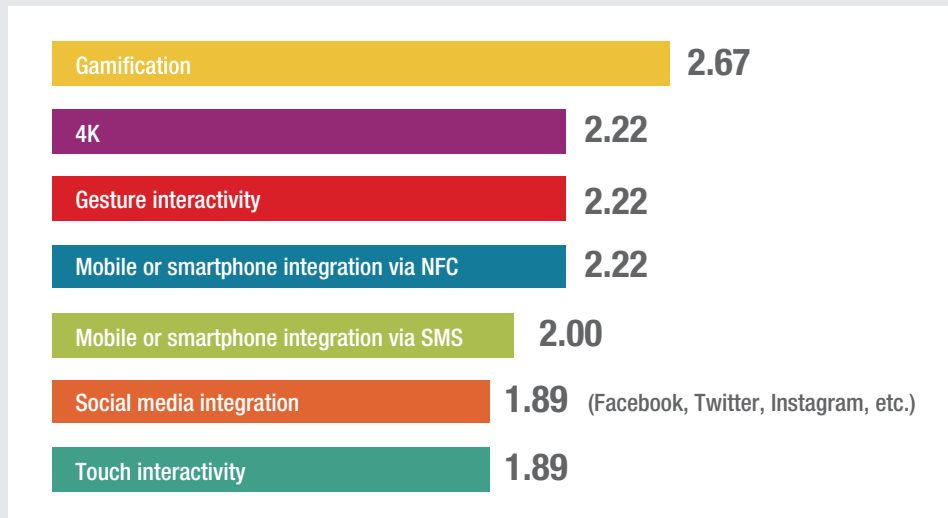
26. What are the key benefits you have seen from deploying digital signage?

Particpants selected all that applied

Benefit	Percentage
Increased customer engagement	**64%**
Improved customer service	**57%**
Improved branding	**43%**
Increased upsell/cross-sell opportunities	**43%**
Increased uptake on coupons/promotions/sales	**43%**
Improved sales associate training	**14%**
Reduced perceived wait times	**14%**
Reduced customer walkouts	**14%**
Reduced losses to showrooming	**7%**
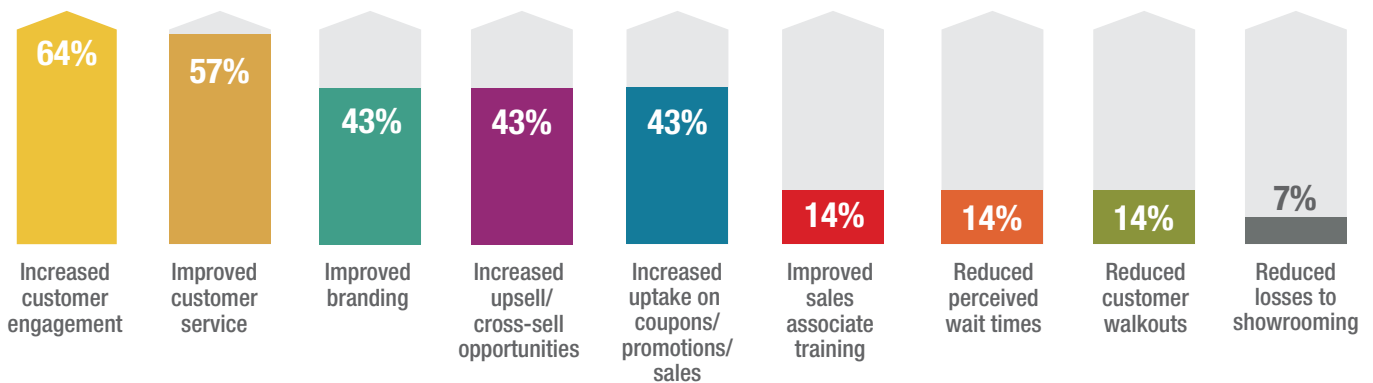
27. Has your bank/FI deployed digital signage or does it plan to deploy digital signage?

Yes
63%

No, but
planning to
17%

No, and
not sure
17%

No
3%

28. If your bank/FI has deployed digital signage, has it

Deployed to all
branch locations?
33%

Deployed to your
single location?
3%

Deployed to no
branches/locations?
27%

Deployed pilots
to some of the
branch locations?
37%
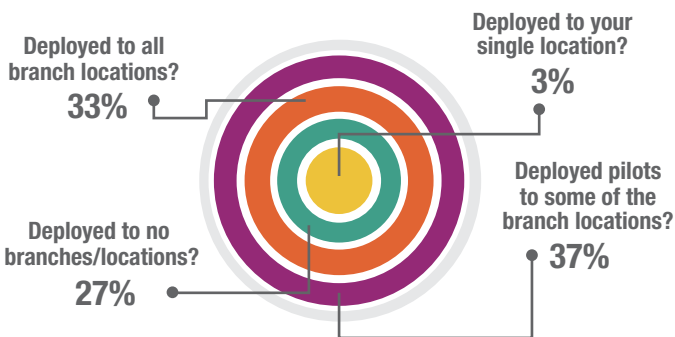
29. If your bank/FI has not deployed digital signage, but plans to, in what time frame do you expect that to occur?

Within the next
6 months
3%

Within the
next year
23%

Within the next
2 years
3%

Have already
deployed
54%
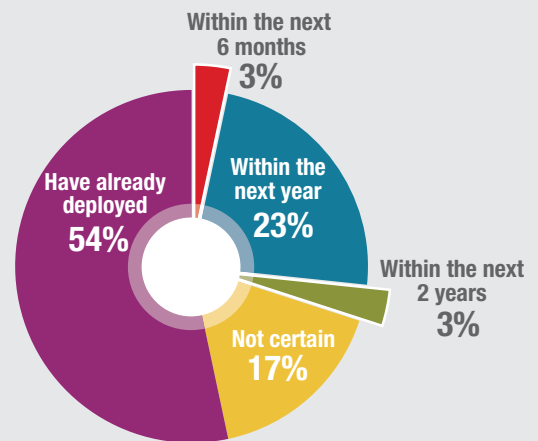
Not certain
17%

30. How would you rate the benefits your bank/FI has seen from deploying digital signage?

6 = Very important   5 = Somewhat important   4 = Not very important   3 = Not important at all   2 = Not certain   1 = N/A

Benefit	Rating
Improved teller/associate training	2.29
Increased uptake on bank promotions	2.08
Improved customer service	2.04
Reduced perceived wait times	2.00
Increased uptake of bank offerings, e.g. financial planning services, loans, etc.	1.88
Increased upsell/cross-sell opportunities	1.65
Improved branding	1.59
Increased customer engagement	1.54
Increased customer awareness of bank offerings	1.5
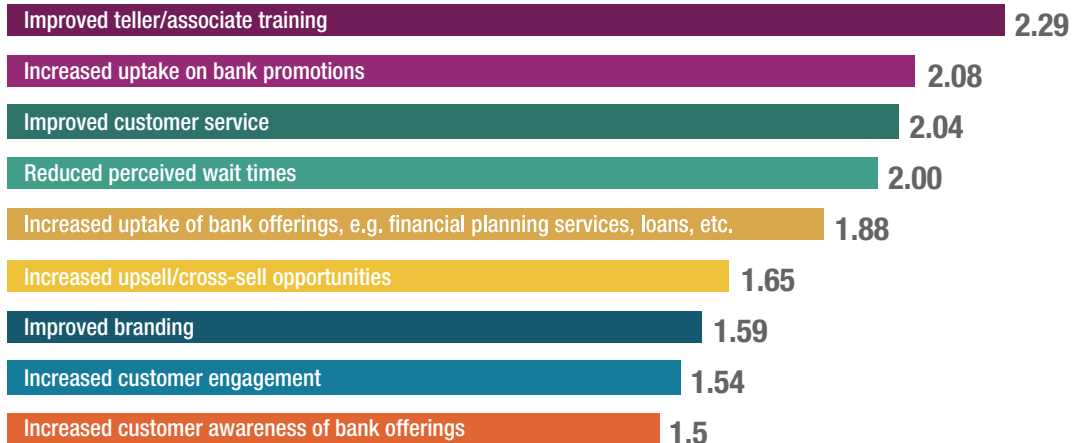
31. How much are you or your agency/company/institution organization planning to spend on digital signage in the next year?

More than $1 million
7%

$100,001 to $1 million
10%

$25,001 to $100,000
24%

$5,001 to $25,000
22%

$0
13%

Less than $5,000
24%
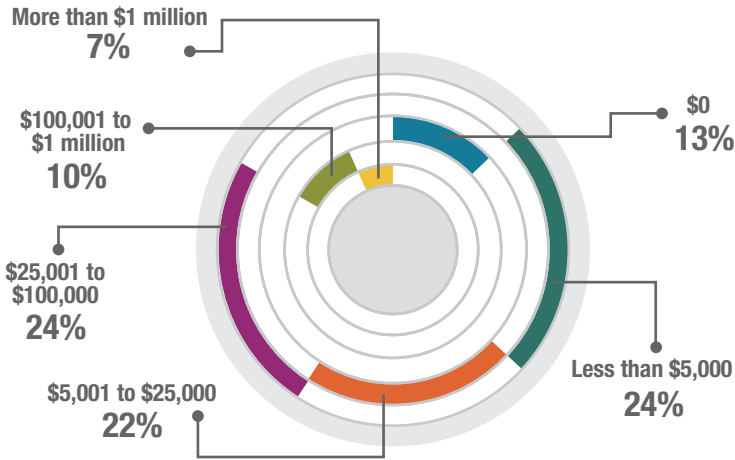
32. How much are you or your agency/company/institution/organization planning to spend on digital signage in the next two years?

More than $1 million
8%

$0
11%

Less than $5,000
20%

$5,001 to $25,000
22%

$25,001 to $100,000
25%

$100,001 to $1 million
14%
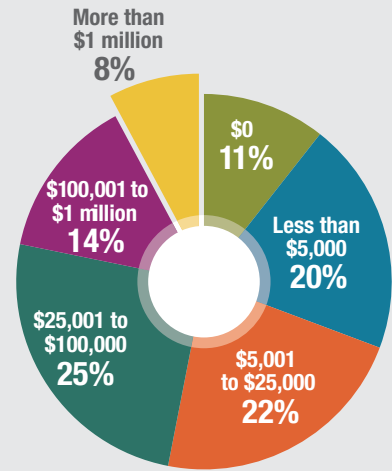
33. How do you plan to spend on digital signage?

Participants selected their top three choices

New displays	**65%**
Content production	**42%**
New deployments	**38%**
New media players or other hardware	**38%**
Content management services	**33%**
Maintenance of current deployments	**26%**
New software	**24%**
Replacing old displays	**20%**
Replacing old non-display hardware	**15%**
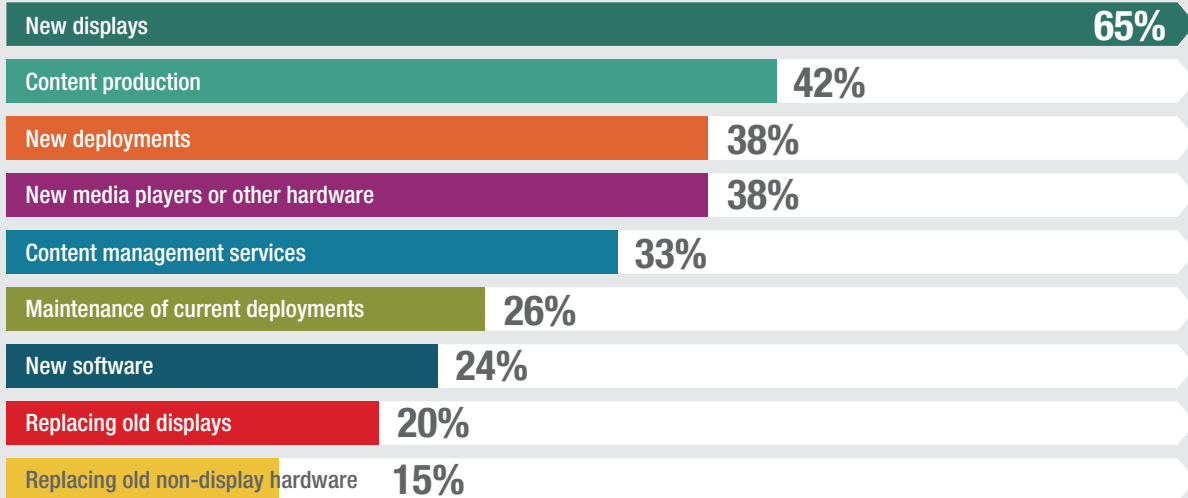
34. How will your budget for digital signage change over the next two years?

Increase
53%

Stay the same
26%

Decrease
1%

Don't know
20%
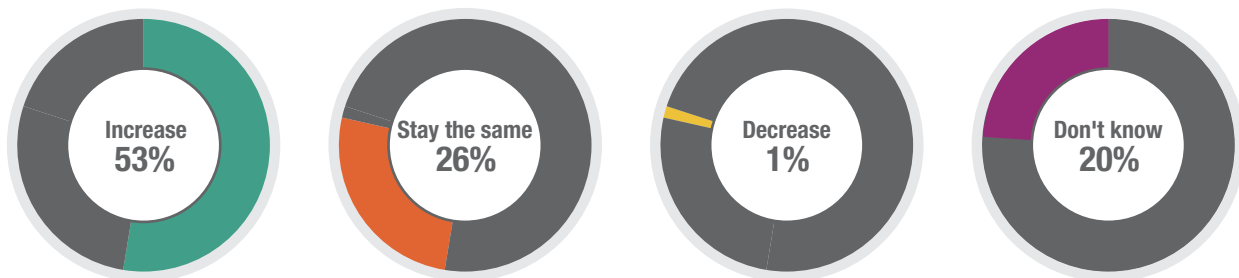
35. How many digital signage screens/displays does your company currently use, across the entire enterprise?

1,000 or more
9%

250 to 999
8%

100 to 249
12%

25 to 99
15%

None
23%

1 to 24
33%
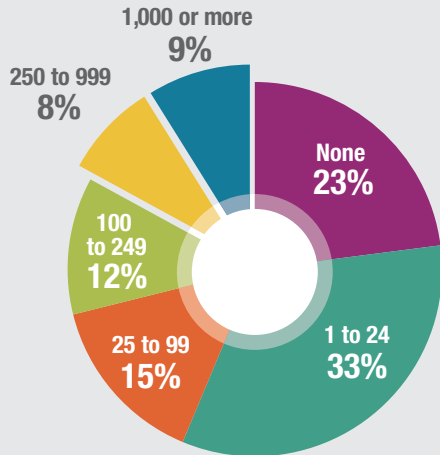
36. How will your portfolio of digital signage screens, or the number of screens you have deployed, change over the next two years?

Decrease
1%

Increase
69%

11%
Stay the same

19%
Don't know
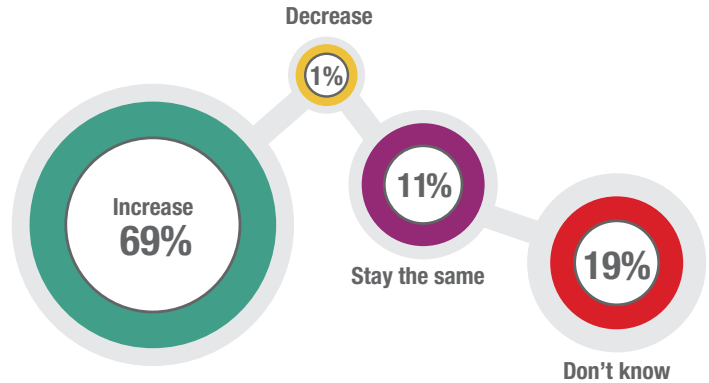
37. If it is increasing, what is the business case for increasing your portfolio?

Participants selected their top three choices
Other includes: Community and employee engagement, information portal, increased productivity, and educational

38%	**38%**	**25%**	**25%**	**18%**	**18%**	**15%**	**12%**	**9%**
Resulted in increased brand awareness	Staying up-to-date with technology	Screens resulted in increased sales lift	Not increasing	Resulted in increase in profit margin/ increased sale of higher margin items	Staying abreast of competitors	Successful pilot, rolling out to larger test	Successful pilot, rolling out enterprise-wide	Other
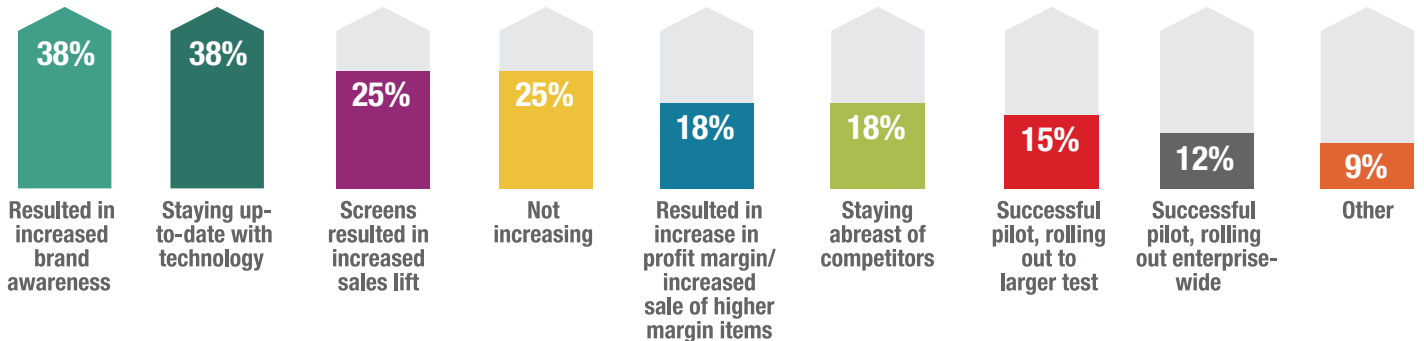
38. If it is decreasing, why?

Participants selected their top three choices

76% Not decreasing

11% Screen failures

10% Content creation too costly

7% Operational expenses too high to maintain

7% Content creation too time intensive

7% Software failures

4% Other hardware failures/problems

4% Maintenance too costly
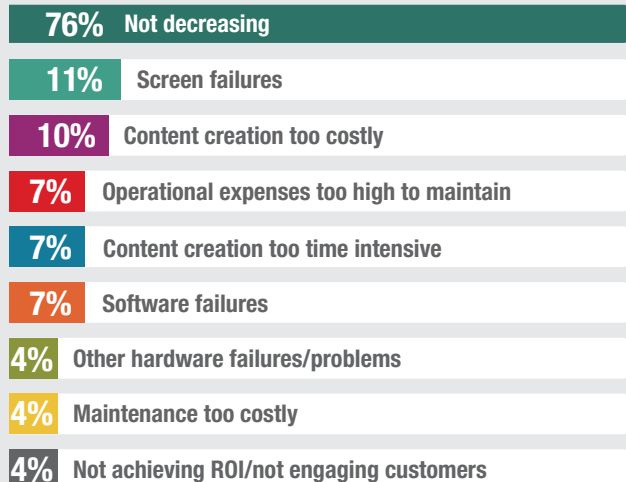
4% Not achieving ROI/not engaging customers

39. Which of the following digital signage features do you have now, or plan to add?

■ **Have now** ■ **Plan to add in the next 2 years** ■ **Plan to add in more than 2 years** ■ **Do not have, no plans to add**

Feature	Have now	Plan to add in the next 2 years	Plan to add in more than 2 years	Do not have, no plans to add
4K	14%	22%	19%	45%
Anonymous video analytics	8%	21%	19%	53%
Gesture Interaction (via devices such as Microsoft Kinect)	8%	17%	23%	53%
3D displays	9%	18%	13%	59%
Touch-interaction	25%	31%	10%	34%
Interface with social media (Twitter, Facebook, Foursquare, etc.)	28%	31%	11%	31%
Interface with POS	23%	27%	10%	40%
Interface with mobile devices	31%	32%	13%	25%
Interactive gamification	11%	24%	17%	47%
Audience measurement	7%	41%	13%	39%

40. Thinking about your portfolio both today and in the future, describe your screens:

■ **Today** ■ **Next 2 years** ■ **N/A**

Screen type	Today	Next 2 years	N/A
All 4K displays	11%	19%	70%
Some 4K displays	14%	25%	61%
All tablet displays (iPads/Android-based tablets)	12%	16%	73%
Some tablet displays (iPads/Android-based tablets)	29%	16%	55%
All consumer-/residential-grade displays	14%	12%	74%
Some consumer-/residential-grade displays	26%	13%	61%
All professional-grade displays	29%	18%	54%
Mostly projection displays	13%	11%	76%
Mostly digital billboards	22%	18%	60%
Mostly LED signs	25%	20%	55%
A mix of backlit and edgelit LCDs	16%	15%	69%
Mostly edgelit LCD	12%	14%	75%
Mostly backlit LCD	22%	13%	66%
Mostly LCD	34%	12%	54%
All LCD	46%	17%	37%

41. In your screen portfolio, do you have:

Display	Today	Next 2 years	N/A
Single large-format displays	55%	13%	32%
Dual displays	39%	13%	48%
Video walls	33%	23%	44%
Tiled displays	25%	13%	62%
Tablet displays	26%	20%	54%
Small-format displays	32%	19%	50%
Shelf-edge displays	10%	14%	77%
Endcap displays	11%	12%	78%
Overhead displays	27%	10%	62%
Networked displays	37%	17%	46%
Touch-enabled displays	27%	24%	50%
Outdoor displays	28%	24%	48%

Legend:
- N/A
- Next 2 years
- Today

42. What is the placement of your screens?

- Entirely employee-facing 9%
- Mostly employee-facing 7%
- Mostly customer-facing 33%
- Entirely customer-facing 51%

43. Do you sell third-party advertising on your employee facing screens?

- Not yet 4%
- Not sure 5%
- No 91%
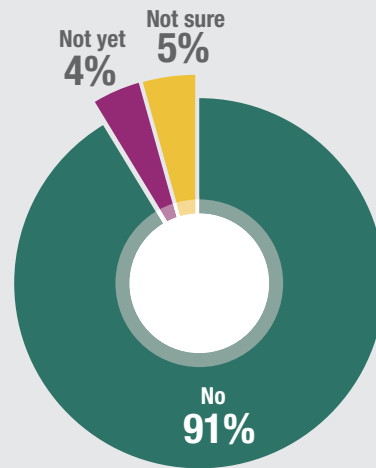
44. For what do you use employee facing displays?

Participants selected all that applied

Company announcements	Employee taining	Employee recognition	News, weather and current events	Employee safety announcements/ reminders	Emergency notification messaging
59%	55%	45%	41%	41%	36%
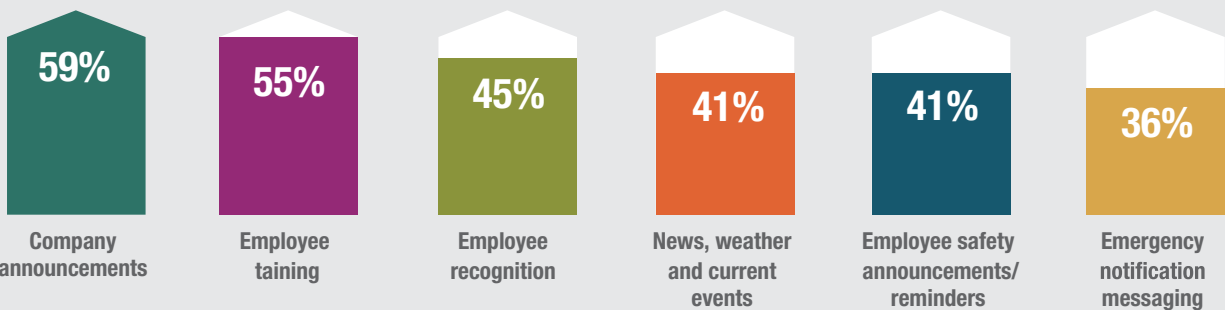
45. Do you sell third-party advertising on your customer-facing screens?

Yes
20%

No
49%

Not yet
24%

Not sure
7%
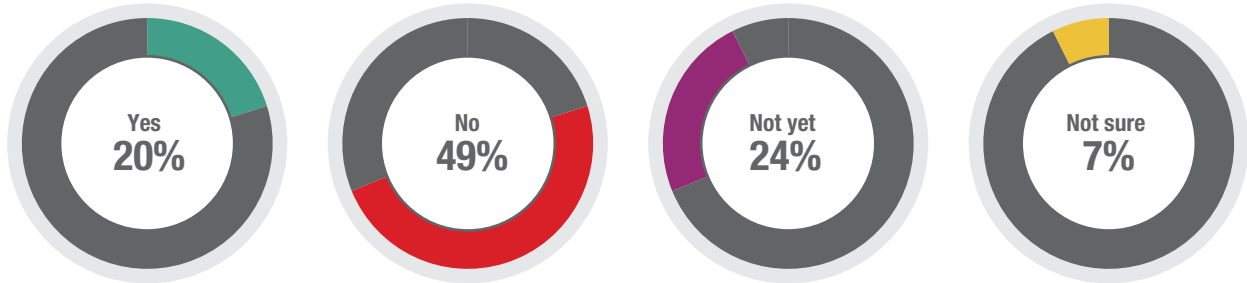
46. How are your screens used today? How will they be used in the future?

Legend:
- N/A
- Next 2 years
- Today

| Category	Today	Next 2 years	N/A
Ambience/customer experience	65%	16%	19%
Assisted selling/product information	61%	19%	19%
Brand messaging/marketing	68%	18%	14%
Digital menu boards	47%	21%	32%
Customer engagement	42%	32%	27%
Customer engagement/gamification	16%	33%	51%
Restaurant, non-menu board	19%	16%	65%
Entertainment channel	24%	19%	57%
Social media	29%	23%	47%
Third-party advertising	16%	27%	57%
Wayfinding	21%	26%	54%
Self-service applications	20%	30%	50%

47. Are your screens networked, so that you can update content remotely?

Yes
52%

No
27%

Some are, some aren't
21%
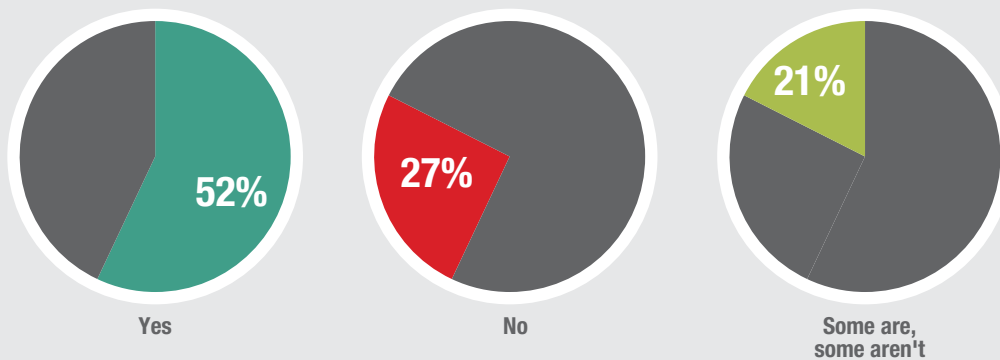
48. Are your screens centrally controlled or controlled at the region or location level?

Combination of control
29%

Centrally
37%

Locally
29%

Regionally
5%
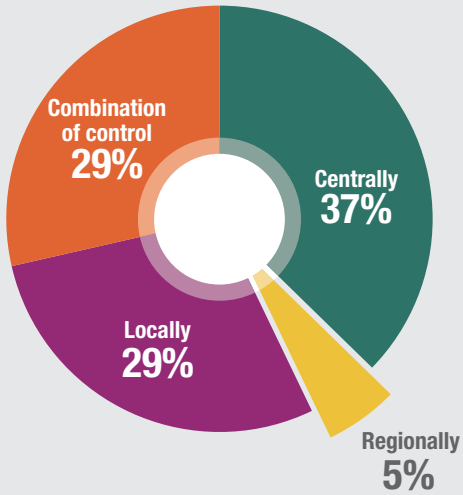
49. Are your screens dynamically updated, or do changes have to be made manually?

A mix of dynamic and manual
39%

Dynamic
28%

Manual
33%
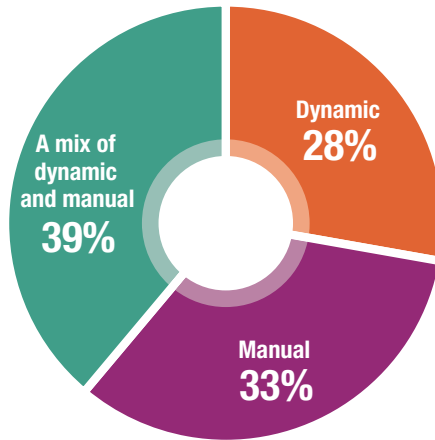
50. If your screens are used to display third-party advertising, what percentage of your screen space/time is devoted to that content?

50 to 99 percent
9%

100 percent
2%

11 to 49 percent
8%

Less than 10 percent
17%

N/A (No third-party advertising)
64%
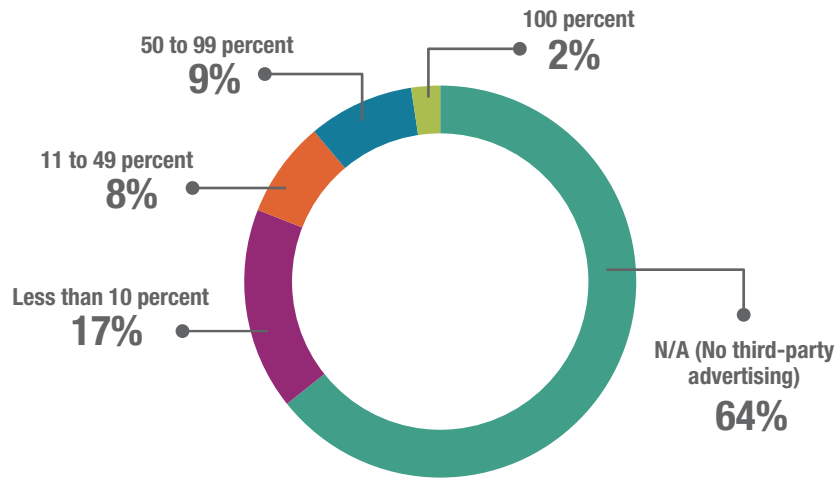
51. If you sell ad space on your screens, how do you sell?

27%

Aggregator

50%

In-house sales staff

23%

Third-party service
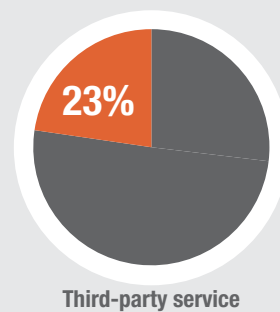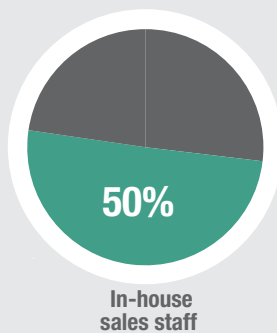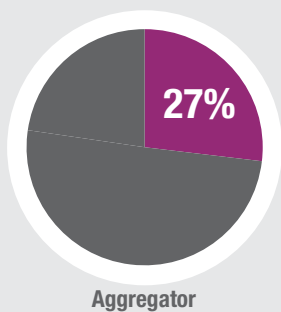
52. Tell us about your content strategy:

Create content in-house
- Today: 60%
- Next 2 years: 21%
- N/A: 19%

Create some content in-house, outsource some
- Today: 35%
- Next 2 years: 34%
- N/A: 31%

Outsource all content creation
- Today: 16%
- Next 2 years: 21%
- N/A: 63%

Legend:
- ■ Today
- ■ Next 2 years
- ■ N/A
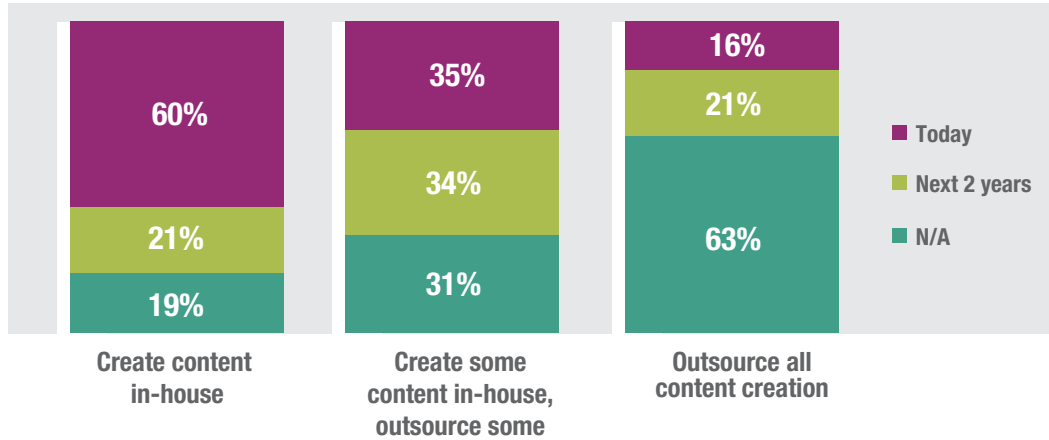
53. As part of your content strategy, have you developed content for:

Smartphones
- Today: 41%
- Next 2 years: 27%
- N/A: 32%

Tablets
- Today: 38%
- Next 2 years: 28%
- N/A: 35%

Kiosks
- Today: 39%
- Next 2 years: 28%
- N/A: 34%

Omnichannel approach
- Today: 25%
- Next 2 years: 34%
- N/A: 41%

Video walls
- Today: 41%
- Next 2 years: 22%
- N/A: 37%

Legend:
- ■ Today
- ■ Next 2 years
- ■ N/A
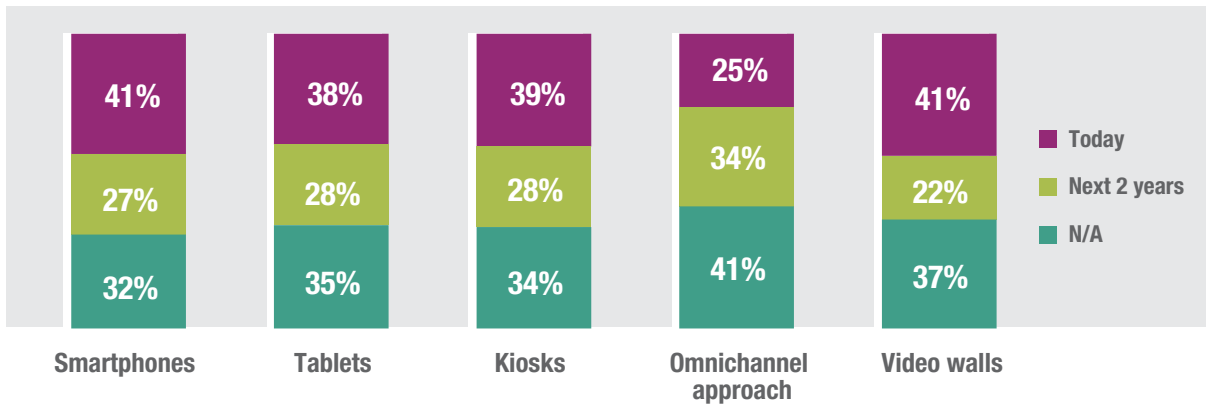
54. How soon will you be deploying new or additional digital screens?

- 0 to 3 months: 22%
- 4 to 6 months: 19%
- 7 to 9 months: 14%
- 10 to 12 months: 13%
- More than 12 months: 14%
- Not planning to deploy new screens at this time: 18%
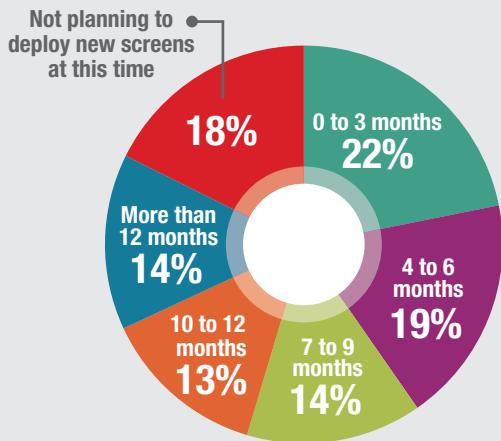
55. How many digital screens do you plan on deploying in the next two years?
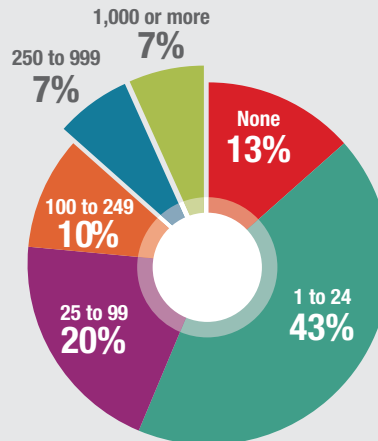
- None: 13%
- 1 to 24: 43%
- 25 to 99: 20%
- 100 to 249: 10%
- 250 to 999: 7%
- 1,000 or more: 7%

56. Which of the following best describes your company/organization?

- **1%** Network Installer
- **2%** Pro A/V
- **3%** Digital Billboard Manufacturer
- **3%** Media Player Provider
- **5%** DS Content Provider
- **8%** AV Distributor/Reseller
- **12%** DS Display Manufacturer

Service Company **19%**
Other **16%**
Software Provider **16%**
Integrator/Installer **15%**
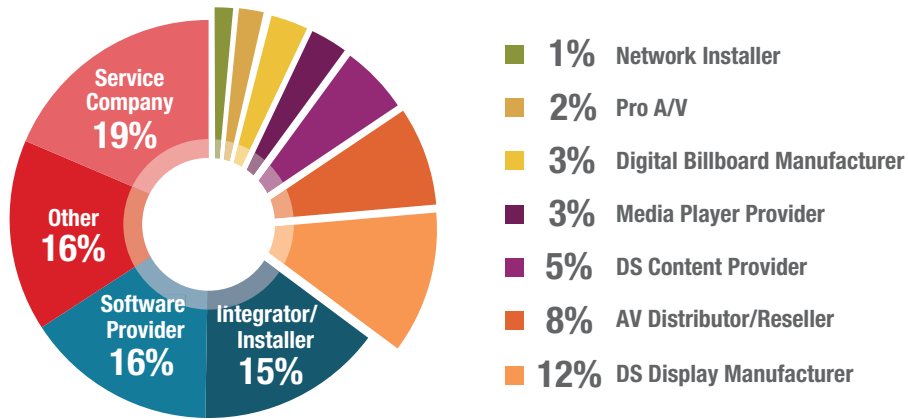
57. What is the size of your company (by annual revenue)?

- $1 billion or more **14%**
- Less than $1 million **22%**
- $100 to $999.9 million **11%**
- $1 to $4.9 million **17%**
- $50 to $99.9 million **6%**
- $5 to $49.9 million **30%**
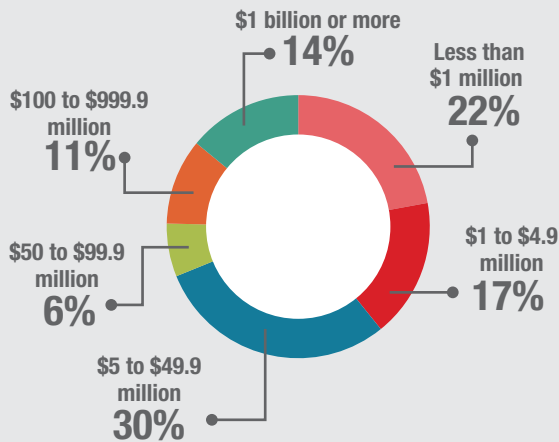
58. Which industry do you believe stands to benefit the most from digital signage over the next two years?

- **1%** Trade show
- **3%** Education
- **4%** Sports/Arenas
- **5%** Government/public sector
- **5%** Hospitality
- **5%** Entertainment
- **5%** Transportation
- **11%** Banking/financial

Retail **33%**
Advertising **14%**
Restaurant **14%**
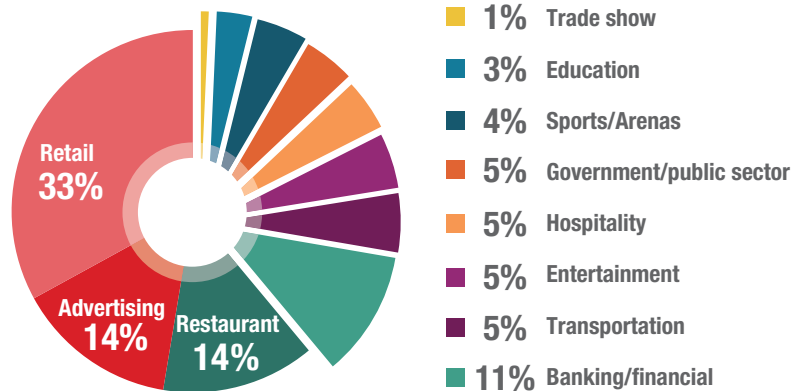
59. Which geographic region do you believe will experience the biggest digital signage growth in the next two years?

Canada **5%**
United States **42%**
Other **13%**
Latin America **9%**
Europe **7%**
Asia **17%**
Middle East **4%**
Africa **2%**
Australia/New Zealand **1%**
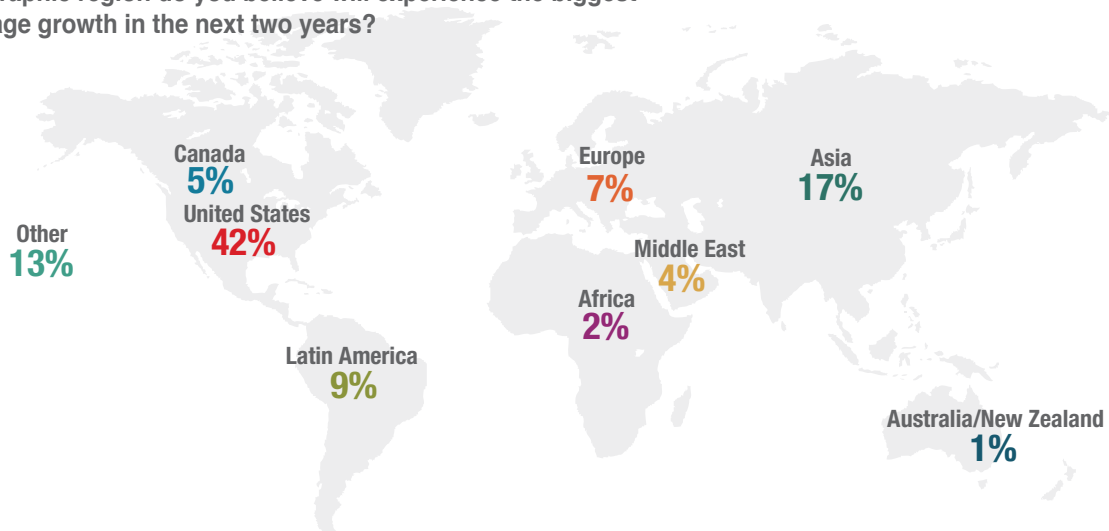
60. Which of the following technologies do you believe will impact digital signage the most over the next two years?

Participants selected their top three choices

NFC interaction with mobile devices	32%
Touchscreen/multitouch	30%
Audience recognition/measurement	29%
Social networking	25%
Biometrics	23%
User-generated content	20%
Gesture-based interaction	20%
Other mobile interactivity	19%
Advances in display capabilities (embedded media players, etc.)	17%
3D display technology	16%
4K	15%
Gamification	15%
RFID	13%
Tablet displays	9%
Advances in screen resolution/definition	9%
Aggregate networks for media buyers	7%
Other	4%

61. What will be the primary reason that companies invest in digital signage over the next two years?

Participants selected their top three choices

Customer experience 58%
Increased customer engagement 49%
Branding 45%
Ad revenue 34%

- 1% Other
- 7% Reduced equipment costs
- 10% Internal communications
- 10% Reduced perceived wait times
- 10% Restaurant menu legislation
- 26% Differentiation from competitors
- 30% Cost savings/efficiencies
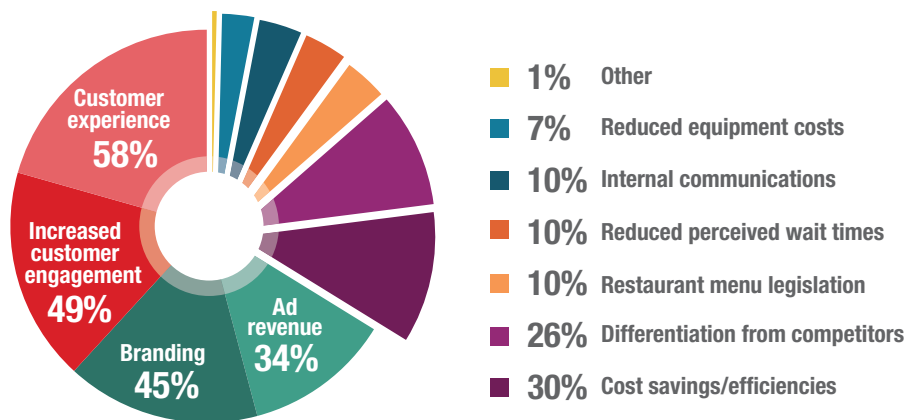
INDUSTRY INSIGHT

4 digital signage trends for 2019

Innovative technologies expand the scope of application of classic digital signage systems and offer new advantages for use at point of sale, in museums, hotels or restaurants. Today, the main focus shifts to interactive content, which according to the trade magazine invidis is the top trending topic.

With one of the largest roll-outs in this sector, McDonald's caused quite a stir recently. We shed light upon four interactive trends for 2019 and beyond.

Deep analytics

A big problem of outdoor advertising is and always has been the blur in performance tracking. Media planners often call this CPM (cost per mile), but what they really refer to is nothing more than a rough estimate value. When it comes to digital content, whether it's perceived as an advertising medium or not, still cannot be measured precisely, unlike pay per click campaigns in online advertising.

Matthias Woggon,
CEO, eyefactive

Matthias Woggon is CEO & co-founder of eyefactive GmbH. A pioneer in interactive signage, eyefactive combines interactive touchscreens, hardware, software and technologies to offer innovative solutions for businesses. Furthermore, clients and partners can create ready to use apps with individual content and designs in the world's first ever app store for professional touchscreens.

Here is where new technologies are coming into play: proximity sensors and cameras with face recognition can measure exactly whether a person is within range and even whether that person is looking at the target medium. Modern algorithms are even able to detect parameters like age, sex and mood by analyzing the facial expressions on the camera footage.

Additionally, touchscreens can measure touches on specific content and can assess the exact performance of advertising campaigns and the return on investment. The combination of face recognition and touch technology allows for measuring how many people react to which content and facilitates the creation of targeted campaigns and sustained optimization.

Touchscreens

Apple introduced multitouch technology to the masses with the iPhone. Now, end users can purchase touch sensors for larger displays at increasingly lower prices. They are excellently suited for customer communication in applications for professional use. Interactive applications can be operated intuitively by the typical gestures.

The technology multiplies the range of application of displays in public areas by far, especially for product presentation and customer consulting at point of sale. There, virtual shelves expand the product range on site and make it available after closing hours by means of an interactive shop window, for instance.

Interactive apps

Despite the growing availability of interactive multitouch hardware, there is still an apparent lack of touchscreen software and software developers in the B2B sector, quite in contrast to B2C with smartphones and tablets.

This is the reason why software for professional touchscreens is being developed individually on demand with comparatively great effort and time expense today. Manufacturers and distributors do encounter a considerable problem selling their displays, especially when low hardware costs do not match the costs of an individual software development. In order for touchscreens to succeed in B2B, standardized software development tools and distribution platforms will have to emerge to appeal to the general public.

Product recognition

We think that a current trend from 2018 will prevail, particularly in the retail market. Interactive product recognition will dominate, because customers can use this technology to scan any product themselves. Subsequently, the corresponding information will be processed and displayed on a screen in multimedia form. For the product recognition various technologies can be employed. Here, QR codes or RFID chips are the modern form of the conventional bar code.

The direct product recognition on touchscreens takes it one step further. End users can attach a round marker chip to an actual product as an aid. The display can then detect the exact location of the product and display corresponding information in its close vicinity on the screen. Subsequently, users can interact with the display via touch operation.

Conclusion

Classical digital signage solutions initially offered savings in time and costs due to the ability to change the content on several displays centrally at any given time. Today, the focus is on customer involvement which is possible thanks to new interactive technologies. Particularly, the retail sector will see a plethora of new innovative solutions in 2019.

Trends in outdoor digital signage and the rise of smart cities

Digital signage is a growing, global industry:

- In the U.S., the market for DOOH is predicted to grow to $12.3 billion by 2028.

- By the end of 2018, out of home digital advertising will have overtaken traditional advertising for the first time in the U.K.

- The U.S. and Europe will retain the largest market shares for several years, but the Asia-Pacific region is expected to grow at the fastest rate due to the adoption of digital signage in the burgeoning economies of India and China.

Whether it's roadside digital billboards, high-street digital totems or through-window touch screens, outdoor digital signage is becoming a familiar part of our city centres.

Ben Telford,
Armagard

Ben Telford is a copywriter for leading, outdoor digital signage enclosure manufacturer, Armagard. Ben blogs about digital signage in all its forms, but he has a particular interest in new technology and innovative applications.

That's because companies increasingly understand that digital signage can be good for business. Whether it's being used to boost brand awareness, engage customers or deliver more efficient services, digital signage has the potential to generate revenue and cut costs.

Customers increasingly expect it, too. They recognise that digital signage can deliver services in a fast, personalized manner that saves time and, often, entertains.

If you're looking to integrate digital signage into your business, or expand and update your existing network, then it's important to keep track of the latest developments. Doing so helps you invest in digital signage that's cost-effective, future-proof and delivers a great ROI for years to come.

In other words, it's important to invest in trends not fads.

Physical trends

Outdoor digital signage is getting bigger — much bigger.

In 2018, Samsung finished installing the largest curved display in South Korea. At a whopping 1,620 square metres, it's four times the size of a basketball court and took seven months to install.

With a resolution almost twice that of UHD, and a brightness capability of 9,000-nits, it's a breath-taking demonstration of what's possible and, no doubt, a brilliant piece of brand promotion for the tech giant.

On the other side of the globe, pop down to New York's Pier 17, in Lower Manhattan's Seaport District, to experience the visual extravaganza that is 2,000 square metres of outdoor LED screens.

Designed to help with the transformation of the area into a cutting-edge retail destination, the displays stretch across the columns, walls and ceilings of a two-story atrium, enveloping visitors in a futuristic shopping experience.

But, while screens grow in one dimension, they shrink in another: the LED displays used at NYC's Pier 17 are just 4-millimeters thick.

Manufacturers are desperate to be known for making the thinnest screens with the slimmest bezels. This race isn't just about brands vying for the top spot; it delivers real benefits for the buyers of outdoor digital signage, too.

Thin screens with tiny bezels provide customers with a better viewing experience, but they're also lighter and more compact, meaning you can use them with greater flexibility in places where you wouldn't have been able to mount a screen before.

If the shift from box TVs to flat screens facilitated the birth of outdoor digital signage, then ultra-thin screens will take it to the next level: immersive displays that can be mounted almost anywhere at increasingly affordable prices.

Thankfully, while displays at the cutting edge get bigger, there's still plenty of reason to measure your signage in inches rather than square meters.

After all, no matter how big screens get, people stay the same size, and engaging customers day-to-day is better achieved with displays that offer a personalized, user-friendly experience.

As such, a trend has emerged in favour of outdoor digital signage in the 32-inch to 75-inch range. These sizes are large enough to capture attention, but not so big that they become unusable or prohibitively expensive for businesses.

This trend is driven by two different approaches. The first uses purpose-built outdoor displays that are inherently waterproof. The second takes advantage of the cost and flexibility benefits of using ordinary screens in outdoor digital signage enclosures.

Outdoor enclosures last for years and don't tie you into a particular model of screen or a single technology. You can swap and upgrade the screen whenever you want, making LED/LCD enclosures the ideal investment for a future-proof digital signage network.

Technological trends

The trend for 32-inch to 75-inch outdoor digital signage is driven by another factor: it's possible to get more technology into a smaller space, so you don't need a huge screen to provide customers with a memorable experience.

Digital signage technology is pushing into some incredible realms. Many of these developments are already here in some form, and those that aren't look set to become the new normal in coming years.

Responsive displays

By responsive displays, we mean web-connected digital signage that adjusts its content according to real-world conditions.

For example:

- A major route out of your city centre is blocked. Public information screens automatically switch from adverts for an upcoming event to the latest travel information just in time for rush hour.
- A sunny morning changes to a wet afternoon. Your outdoor digital display adjusts its content to advertise umbrellas rather than sunglasses.

Responsive displays deliver the most relevant or helpful content at a given time, making them equally useful for digital advertising and public information.

The great thing is that the technology depends on the media player, not the screen. The cost of new media players could be far less than that of new displays, making responsive technology a great prospect for businesses looking to stay at the forefront of digital signage trends without breaking the bank.

Facial recognition and Artificial Intelligence (AI)

There was a time when the local storekeeper knew the name of all her customers. Those days are largely behind us, but facial recognition may be filling the gap.

AI and facial recognition use historical data to draw correlations between customers and their interest in particular products and services.

For instance, facial recognition cameras enable displays to recognise a customer, greet them, and suggest products or services based on their purchasing history.

Alternatively, AI can analyse the appearance of a customer and promote products based on their age, what they're wearing or any other number of factors.

This technology promises to move outdoor digital signage from a passive medium to a personalised experience — much like touch screens have done in the last few years, but in a more individualized way.

As well as driving sales in real time, facial recognition delivers audience analytics that can be retrospectively viewed:

- How long did a person spend looking at the display?
- What did they press or interact with?
- What age and gender were they?
- What were their facial expressions during their interaction with your signage?

Just as you track the demographics, dwell time and page views of your website visitors, it could soon be normal to analyse interactions with your digital signage in the same way.

The promise of a better experience for consumers, and data-driven marketing tactics for businesses, makes facial recognition a trend that looks set to stay.

Like responsive displays, the possibility of incorporating cameras and software into existing displays will be an attractive one for businesses looking to engage customers with their current digital signage network.

Haptic technology

Haptic technology could be the next big thing. It uses one of a number of technologies to convince a user's brain that they're touching something with shape and texture, transforming a one-dimensional display into a truly sensory experience.

One approach uses electrostatic fields to reproduce tactile sensations on digital screens. An alternative uses ultrasound waves to produce tactile, 3-D sensations in mid-air.

The market applications of these technologies are numerous. Want to know how one item of clothing feels compared to another? No problem. Electrostatic technology can be integrated into digital signage to give customers a realistic indication of texture and help them make a purchasing decision.

Haptic technology may be the next thing brands draw on to engage customers. The promise is that sensory experiences stick in the memory, delight customers and forge a lasting impression of your brand.

Of all the trends here, haptics is in the earliest stages. Manufacturers, however are rolling out better technology all the time, which makes it a viable option for businesses that want to stand out from their competitors with something that's genuinely cutting edge.

At the very least, its potential to be integrated into your existing digital displays makes haptic technology something to keep an eye on in the coming months and years.

Advances in media players

It's easy to assume that the most important trends in outdoor digital signage are a result of new screen technologies, but advances in media players are just as significant.

For instance, while the scale of Pier 17's digital signage network is impressive, the way that the content can be controlled is just as important. Individual screens can display completely different content, or the whole network can be combined to act as a single, synchronised digital canvas.

This functionality is a crucial part of delivering an engaging customer experience. It also allows the owners to use the displays in the most profitable way at any given time.

Trends in media players also reflect a desire for convenience. Many displays feature media players that allow remote control of content. This allows you to install digital signage further away from your business, generating greater brand awareness without the inconvenience of frequently attending each display in person.

Advances in media players don't grab headlines, but they're important from a business point of view. Many of the latest digital signage technologies can be integrated into existing displays with, in part, an updated media player.

When it comes to getting on board with the latest trends, then, investing in new media players can be far more cost-effective than replacing your whole digital signage network.

Interactive digital signage drives innovation in retail, financial services and smart cities

Digital signage woven into the urban landscape is nothing new. Most businesses use some form of static or dynamic digital signage to attract and engage customers in retail shops, restaurants, museums, performance venues and transportation hubs. But the next wave of innovation is rooted in interactivity. A growing number of businesses and municipalities are using kiosks to deliver an interactive experience, thereby deepening the connection with customers and visitors alike.

Interactive digital signage bridges the gap between the online world and the customer. The latest large-format, touch-enabled interactive screens and kiosks create new modes of customer engagement for businesses and other institutions. Here are a few examples of how interactive digital signage is changing the landscape in cities across the globe.

Noting that bank branches are closing but cafés are prospering, Santander in South America, in partnership with customer experience specialists PX Group, created WorkCafé in Chile, which turns a common branch into a community space: half bank and half café. Each WorkCafé has an interactive video wall with one interactive and three static 55-inch screens presenting information including news, economic statistics, promotional material for Santander and other details.

Ebebek, Turkey's leading mother-and-baby-product retailer, and Istanbul-based digital retail specialist Phygital Mind used large-format interactive kiosks to deliver a completely new concept for the customer journey, fully integrating e-commerce with assisted sale and endless aisle. The terminals support ebebek's expert staff in guiding customers through the full range and allowing shoppers to browse independently.

Beyond the businesses themselves, there's a rise in "smart city" installations, whereby municipalities create a new digital infrastructure that features public-access interactive kiosks located at key points throughout the city.

Ian Crosby,
vice president of sales and marketing, Zytronic

Ian Crosby is Zytronic's vice president of sales and marketing, managing the company's growing global commercial activities. Prior to Zytronic, he was global account director at Filtrona, and before that he spent 15 years at Corning Inc. Crosby earned a Bachelor of Science with honors in combined science at North Staffordshire Polytechnic.

These kiosks provide citizens and visitors alike with a new wealth of information and civic services on demand, on a 24/7 basis. To ensure a user-friendly experience, it is vital that the user can connect through a reliable, all-weather, responsive and durable touchscreen interface.

For example, the Citybeacon project in Eindhoven, Netherlands, features a 32-inch touchscreen display, enabling easy access to local information and directions. Two double-sided advertising screens at the top of the unit provide public service announcements and local business promotions. These kiosks are the cornerstone of Eindhoven's smart city initiative, and similar projects are underway across the globe.

In all three examples, large-format interactive touchscreens are central to enabling the experience and making information, services and products more accessible. Whether businesses seek a deeper connection to customers or cities want to communicate more seamlessly with their citizens, interactive digital signage makes this possible like never before.

INDUSTRY INSIGHT

Real-time graphics in a real-time world

Welcome to the digital era! This is a time when our devices are a normal part of our everyday lives. We now crave and seek out things that quickly entertain us and experiences in which we can feel connected or completely immersed in a different world. We're constantly looking for interactivity, a connection to one another; after all, it's human nature.

A whole lot of resources are currently being dumped into technologies, such as VR and especially AR — which, in my opinion, is going to completely take over and change life as we know it.

As we accelerate into the future, project demands and requirements are becoming more difficult. Time schedules are being shortened and budgets are being tightened. To add to this, projects are becoming more complex.

This shift requires the ability to create, analyze and react in real time. Reactionary media (which is what I am calling it) is the solution.

Reactionary media is becoming mainstream in all market verticals. From the medical fields to live entertainment, it's everywhere. Whether it's a webpage, a video file or an interactive generated piece of art, our need for tools in the real-time world has never been more necessary than in the present.

Luckily, a number of different companies are focusing on fulfilling those needs and solving these problems. A couple of the main companies creating some of these solutions stem from the gaming industry. Did you know that almost every major branded media playback solution on the market originated from that area?

This past August, I had the opportunity to attend the Siggraph show and exposition in Vancouver, Canada. It's one of my favorite shows because it displays breakthroughs and emerging technologies in the computer-generated graphics industry. It also demonstrates many different types of upcoming immersive interactive solutions and hardware.

Geoffrey Platt,
director, RealMotion

Geoffrey Platt is a veteran in the media server and digital content community. He started his career in the live entertainment industry and quickly began expanding his experience by pursuing a multifaceted career. With expertise in film, television, cruise ships, concerts and the corporate events industry, Platt has served clients around the world. He has been proud to design high-profile events and has been involved in a vast number of projects using some of the most cutting-edge video/lighting technology available.

One of the main announcements this year was the release of the new RTX and Quadro line of graphics cards by Nvidia. This was big news because the company had announced that it was able to solve the holy grail of all computer graphics inherent issues: the real-time rendering of light. Incredible! But what does this do for us? It gets us one step closer to being able to render photorealistic scenes in real time.

Unreal, a gaming engine software company, demonstrated a cool project for Porsche. It showed a rendering of a Porsche sports car, allowing the user to move lights around in the scene, showing off different photorealistic lighting possibilities while using a tablet device to interact with it in real time. These types of solutions are paving our way into the future and changing the way we look at, create and manage media.

Interactivity is another big demand in today's audio-visual markets. We've been seeing huge leaps and bounds in interactive devices and software-based solutions. These advancements help bridge logic to these new devices to help them communicate to the different real-time rendering environments. Lidar and analytics are other emerging technologies that have recently entered the market, allowing for the tracking of large groups of people in a space. This allows interactive displays to span large, open spaces seamlessly. Analytics feeds back data on how people are interacting with these different experiences.

These emerging interactive technologies all require one common element: the ability to create, analyze and react in a world that needs real-time-based solutions. Luckily for us, many different options are on the market today. These solutions are rapidly evolving and changing to meet the needs of the most complex projects.

As you begin exploring the possibility of integrating some of these new technologies into your next project, don't be afraid to reach out to some of these companies to learn and test drive what they have to offer. A lot of different options are available, and resources can be found in many of the magazines and websites that you probably read today. I look forward to hearing about some of the amazing projects in which you have used the latest in real-time rendering solutions.

An eye on network advancements, video walls and kiosks

Digital signage is constantly evolving, incorporating the latest advancements in technology and addressing the newest trends across the industry. With these continuous advancements happening on what seems like a daily basis, businesses are being given unique ways to present content to consumers and reach target audiences. This often leaves us wondering, what will be next?

With 2019 fast approaching, we predict four areas will experience the largest growth and change: advertising-based networks, corporate communications, retail and quick-service restaurants (QSRs).

Advertising-based networks

Ad-based networks, both indoors and outdoors, are finally maturing. With this, data analytics can be measured and provided to advertisers, justifying a return on investment (ROI). Previously, digital signage networks were integrated — advertisements would be placed and advertising networks touted enhanced brand visibility, but there was no accurate means of measurement.

Now, through anonymous analytics and data-based tracking devices, these advertising networks can provide advertisers with detailed information to provide proof of the ad's performance, such as how many people passed by the signage, how many people interacted with touchscreens and more. With this, more data-driven decisions can be made, leading to increased ad revenue. We anticipate these networks to experience high growth over the next several years.

Corporate communications

Throughout recent years, many corporations have acknowledged the need for digital networks to efficiently communicate with employees. Now, these networks are not only being enhanced, but also growing in ubiquity.

Brian McClimans, *vice president of sales, Americas and APAC, Peerless-AV*

Brian McClimans serves as vice president of sales for North America and APAC at Peerless-AV. In his role, McClimans is responsible for managing all sales initiatives within the North America and Asia-Pacific regions. As an energetic and engaged leader who believes in creating partnerships with customers on a global scale, McClimans works closely with his European counterparts to ensure a unified strategy for Peerless-AV. McClimans possesses specific knowledge within the education, restaurant, retail, hospitality, health care and entertainment vertical markets as it pertains to digital signage, wayfinding, kiosks, outdoor displays and large-format mounting solutions.

Many companies are moving toward specialized and revamped software to better serve corporate communications networks' needs and goals. Updates here are software-driven, leading to providing employees more refreshed and more relevant content on the screens in their places of work.

With these new advancements, messages can be read by employees on their computers and displays throughout the buildings and throughout their campuses. For example, one well-known entertainment company that used to print thousands of company communication magazines per week now negates the waste of paper, printing resources and time in lieu of more up-to-date efficient digital communications.

Retail

Retail settings have been the largest growth sector over the past 10 years for video walls. However, many of these video walls have exceeded their lifespans of approximately five to seven years when running 24/7, making it an optimal time for replacement.

A large growth factor amid these refreshes is the shift toward direct-view LED displays. LCD displays, as many retail settings have used, may be less expensive, but they have bezels, causing divisions between individual screens. With direct-view LED displays, a seamless video wall can be created. Furthermore, thanks to an uptick in the economy since the implementation of these older walls, many retailers are ready to spend additional money to create a higher-quality video wall that offers additional integration options. With direct-view LED displays, retailers can create uniquely shaped video walls in wave or geometric designs.

Quick-service restaurants

QSRs have finally committed to digital signage. The most recent trend here is the rollout of indoor digital signage in just about every major QSR chain.

With minimum-wage increases affecting profitability and difficulties in finding employees to fill those positions, along with customers' acceptance of placing orders themselves, new self-ordering kiosks are popping up every day. Implementation of self-ordering kiosks will continue rolling out on a large scale, as long as they are done correctly with software that is easy to understand and use and is fully integrated into the restaurants' POS systems. It's also important that QSRs not forget to clean these kiosks frequently.

It has long been known that QSRs with drive-thru lanes see 60 percent or more of their daily revenue come through this type of ordering. With that being said, though, only recently have major QSRs chosen to implement digital drive-thru menu boards for customers. This could be the biggest growth area for digital signage for 2019, with more than 10,000 drive-thru lanes expected to be implemented in 2019. To address this trend, many manufacturers are offering solutions that can aid QSRs' drive-thru operations.

Here's to another exciting year in the industry as we await the innovations 2019 will hold.

INDUSTRY INSIGHT

Ransomware exposes cracks in PC-based digital signage

A number of ransomware attacks in recent months targeted digital signage and other IT infrastructure at large-scale facilities across the United States and abroad. Not long ago, airport staff temporarily disabled flight information screens at the Bristol Airport in the U.K. after perpetrators accessed the airport's network and demanded ransom payment.

Hackers target airports and other large-scale facilities because they are high-visibility targets where the potential for disruption is significant; taking even a small airport offline for a few hours could have a massive ripple effect felt by the entire commercial air travel network. Hackers know this, and they assume that an airport's executive staff would be highly motivated to avoid such a disruption — maybe even motivated enough to meet a ransom demand. Fortunately, airport staff in Bristol were able to regain control of their network, and they didn't pay up, but not everyone is so lucky.

These attacks teach us that some of the most visible targets are also some of the most vulnerable. Airports and other transportation hubs have very large networks with hundreds or even thousands of internet-connected devices deployed throughout the facility. No doubt the core network infrastructure is monitored with great care, but the network's security is only as secure as its weakest point.

Digital signage often falls into this category. In particular, when displays (such as flight information displays within an airport) are connected to a PC, the entire network becomes vulnerable to the same security threats faced by any network-connected PC.

The problem isn't the PC itself — it's that these PCs almost always run consumer operating systems, which require constant oversight to keep up with security threats as they emerge. They're intended for personal computing whereby the user has daily interaction with the PC; this enables the user to configure anti-virus software and perform security updates as needed.

Jeff Hastings,
CEO, BrightSign

Jeff Hastings is CEO of BrightSign, the market leader in digital signage players. He is responsible for the company's global strategic direction. Prior to BrightSign, Hastings held leadership positions at prominent digital media companies, including Corel, M-Audio and Pinnacle Systems. He previously served as president of Rio, the company that pioneered the MP3 space by introducing the industry's first MP3 player. Hastings holds a BS in computer science from Purdue University and holds eight U.S. patents.

But the reality is that the PCs running digital signage are rarely maintained as vigilantly as PCs in a home or office setting. PCs used for digital signage are commonly used to push content to digital signage endpoints, but they rarely (if ever) receive security patches to plug vulnerabilities within the PC itself. Unless a PC-driven digital signage network is monitored continually and patched immediately to counter new security threats as they emerge, that network is vulnerable. Hackers prove time and time again that PC-based networks are vulnerable, despite administrators' best efforts to fortify them.

The most effective way to thwart ransomware attacks on digital signage networks isn't to double-down on PC security – it's to eliminate PCs from the equation entirely. Purpose-built, commercial-grade digital signage hardware is the more secure, reliable way to run a signage network. With a dedicated operating system and hardware configured for the sole task of managing signage content, digital signage media players outperform PCs in their ability to manage content, and they're much more secure because they function within a closed ecosystem. And in the rare instance that a security threat emerges, it's easy to push software updates to an entire player network without requiring intervention at the endpoints themselves.

To better understand why purpose-built media players are more secure and better suited to signage than PCs are, a quick look under the hood reveals an important point of differentiation. For example, a good chipset can help deliver strong content protection.

Some features you should look into with digital signage hardware include:

- Hardened key management via a security processor.
- Secure boot verification and decryption.
- Dedicated processor for DRM support.
- Decrypt engines for all distribution standards.
- Specific hardware countermeasures for side-channel attacks.
- Memory client access protected with intrusion detection.
- Encryption of all memory traffic.

New year, new trends

The digital display industry continued to evolve in 2018, and much of this was driven by the growing sophistication of advertisers who are looking to extend the digital experience of smartphones and televisions to message centers.

As we approach the new year, we anticipate these trends will accelerate to include:

Barry Pearman, *director of interior display systems, Watchfire Signs*

Mini/micro-LEDs delivering TV-like resolutions. For applications requiring very high resolutions, there was only one choice until now: use televisions. With the introduction of new mini/micro-LED technology, digital displays can deliver very large resolutions with standard HD or above, but with advantages over TVs, including the ability to be used in bright spaces and better energy efficiency.

The ability to extend the brand. With higher resolutions, advertisers are finding message centers can be the perfect place to expand the brand. Retailers, banks, municipal buildings, event facilities, schools and worship spaces are able to move beyond "PowerPoint type" graphics and advertise by using beautiful images that are in keeping with brand guidelines.

Integration with inventive architecture. The limitations of traditional rectangular LED message centers have been replaced with more flexible designs that enable message centers to wrap around structures, fit non-standard shapes such as circles and retrofit vintage signs. All of this allows advertisers to capture more attention.

Professional-grade scoreboards for high schools. Middle and high schools are realizing the fan-engagement capabilities and sport flexibility provided by virtual scoreboards. As prices come down, schools not only are embracing this technology, they also have found innovative ways to integrate content development and video board production into the curriculum.

Content moving to the cloud. Advertisers today expect to be able to run their message centers from the cloud. All-in-one packages, in which the manufacturer offers a cloud-based content management solution, are gaining favor with advertisers who are looking for one contact for support and want a streamlined way to push content to a network of message centers all at once.

Dynamic content on steroids. Advertisers are accustomed to using RSS feeds to drive dynamic content, such as ads based on weather or time of day. Now advertisers are expanding on this concept by looking for message centers that enable them to easily tag national ads to display content relevant for specific locations.

Analytics and experience take front seat

The beginning of 2019 happens to be a remarkable time for digital signage. All of the exciting technologies that people have been talking about for years are finally starting to materialize, like 5G, the internet of things, and big data projects. Of course, these technologies are finally thriving because we now have applications to drive their demand. That's why digital signage is especially interesting right now – the application of digital signage pulls together all of these technologies do deliver amazing results, both in terms of analytics and experience.

Right now, especially in retail, everyone is talking about how to better target customers with digital signage. People are starting to realize that signage can be much more than just a conveyor of advertising and immersive content. Instead, signage is part of a larger ecosystem or solution that helps owners better understand their business. We're no longer limited to using signage for simply delivering content to our audience. Now, in a way, signage can help us ask our audience questions about how to better serve them.

Kevin Christopherson, *director of product marketing, NEC Display Solutions*

Kevin Christopherson is Director of Product Marketing at NEC Display Solutions of America, managing the complete product lineup of LCD large format and desktop displays.

Signage can in fact be part of a larger system, including cameras, beacons, RFID, cloud computing and dashboards. This system can help owners determine who their audience is and what content to show them, but also to understand all sorts of things like: how people move through a space; during what time; how the weather affects these movements; where and when inventory needs to be moved; or how demographics change depending on circumstances.

And as is always the case with such matters, this needs to happen in a way that respects the audience's privacy. That means anonymizing data and keeping it away from where it could be compromised. No one likes feeling like they're being watched or taken advantage of, so seamless and secure delivery of these insights needs to simultaneously deliver an experience to the audience that feels welcome and natural.

So digital signage's role in this system is twofold – deliver content, but also deliver it as part of that welcoming and natural experience. Building that experience is where the latest signage trends comes into play – larger displays, direct view LED (dvLED) and projection.

These solutions are designed to inspire awe and capture the imaginations of the viewers. For example, increasingly large displays with smaller bezels can deliver more information to larger groups of audience, as well as being eye-catching for their size alone. The small bezels allow this effect to be amplified when displays are arranged in video-wall formations, where the size of the bezels allow the multiple images to blend into one larger picture.

In the same vein, dvLED panels are highly customizable and can create experiences that encircle the audience or create architecturally captivating focus points. With pixel pitch options for anything from close-up viewing to distant viewing for larger venues, owners can use dvLED to provide a completely unique and memorable experience.

Even the latest projection technology crosses the threshold between projecting an image and providing an experience. Projection mapping, for example, is taking off as an effective attention-grabber that projects images onto a 3-D surface to enhance the depth of the image. There's no limit to what projection mapping can do, and projects have ranged from entire building facades to shoes for sale on a shelf.

For years we've been using digital signage to set the foundation of an engaged audience. The next step is putting the analytics piece in place. Once the first wave of these full-system projects are complete, you can expect this practice to take off like a wildfire as owners see the additional value it provides.