XR ASSOCIATION

A NEW REALITY IN IMMERSIVE TECHNOLOGY (XR): INSIGHTS AND INDUSTRY TRENDS



EXECUTIVE SUMMARY

Virtual, augmented and mixed reality technologies (XR) are transforming the way we learn, do business, communicate, and provide essential human services. As a result, XR is playing an increasing role as a preferred enterprise solution to enhance collaboration, reach out to new customers, train employees, boost productivity, and assist business continuity, among other things. That has never been more necessary as we confront the challenges of social distancing brought on by the COVID-19 pandemic, which has brought into sharp relief the need for innovative technologies to help enterprises address global events that upend our day-to-day lives and the operations of businesses, governments and other entities forced to conduct business in remote and/or virtual settings.

To shed more light on how enterprises both regard and use these emerging technologies, the XR Association (XRA) partnered with The Martec Group on a first-of-its-kind survey of business leaders' current knowledge, use, and utility of XR. The results of the survey ¬reveal that business leaders are looking to XR technologies to help solve some of today and tomorrow's most pressing challenges in their fields, particularly for applications that enhance the effectiveness of distance learning and enabling better communication and training opportunities among employees. The six industries surveyed — healthcare, higher education, workforce training and workplace connections, retail, manufacturing, and public safety — were selected because each has been in the vanguard of embracing XR for their business needs. Unfortunately, each of these sectors also has had a unique burden placed on their traditional day-to-day operations by the pandemic.

The survey found that optimism and enthusiasm for XR technology among these industries was even greater than expected. Business leaders in decision-making roles across all sectors broadly recognize the promise of XR to meet the demands of a new workplace paradigm both during the pandemic and in a post-COVID-19 economic recovery. In fact, nearly two in five business leaders surveyed said they are already using virtual reality (VR), mixed reality (MR) and/or augmented reality (AR) or are currently investing in those technologies to aid their businesses.

For example, of the current XR applications being used during the pandemic, industry decision makers offered the following examples: XR programs for warehousing and inventory needs in manufacturing and retail; VR employee training in healthcare, public safety and job training industries; and virtual field trips and virtual science labs for distance learning in education, to name a few. As one retail decision maker told Martec Group, "The [return on investment] is simple to calculate for management. We can train someone faster, and the training is more powerful due to the immersive nature of the tool."

EXECUTIVE SUMMARY (CONT.)

Additionally, three out of four leaders said their businesses are likely to spend more on XR technology over the next five years, indicating potential growth for XR enterprise applications across the sectors surveyed.

While optimism about XR technology is extraordinarily high among business leaders, real and perceived barriers to adoption remain. When business leaders were asked to choose the top three barriers to XR technology expansion, 26 percent chose potential costs as their top reason. It appears the pandemic may be, in part, driving end users' ability to purchase XR or other new technologies. For example, public safety and education leaders, in particular, cited pandemic-stretched budgets as a reason that their organizations' investments in XR might be limited, and

Regardless, business leaders are eager for new advancements in XR technology, and they largely agreed that the federal government has a role to play to facilitate the development and adoption of XR technologies, primarily through federal funding for research and development.

In sum, business leaders believe the future of XR technologies is bright, and the vast majority believe their own industries will be leaders in adopting enterprise XR solutions for their businesses.

KEY FINDINGS OF THE SURVEY

Business leaders believe XR technology can assist their organizations in navigating the current COVID-19 pandemic in a variety of ways, particularly in enhancing distance learning and enabling better communication and collaboration.

- Thirty-six percent identified XR technologies as being able to help enhance the effectiveness of distance learning to ensure continued educational and workforce development.
    - Amongst educators, a hefty 58 percent identified distance learning as a potential benefit of XR technology during the pandemic.
- Thirty-five percent identified XR technologies as a tool to enable better communication or collaboration between staff, customers, students and/or patients beyond well-known video conference software.
- Seventy-one percent would be interested in attending an industry event in VR during and after the COVID-19 crisis, and 87 percent have been prevented from attending important trade shows and conferences due to the pandemic.

KEY FINDINGS OF THE SURVEY (CONT.)

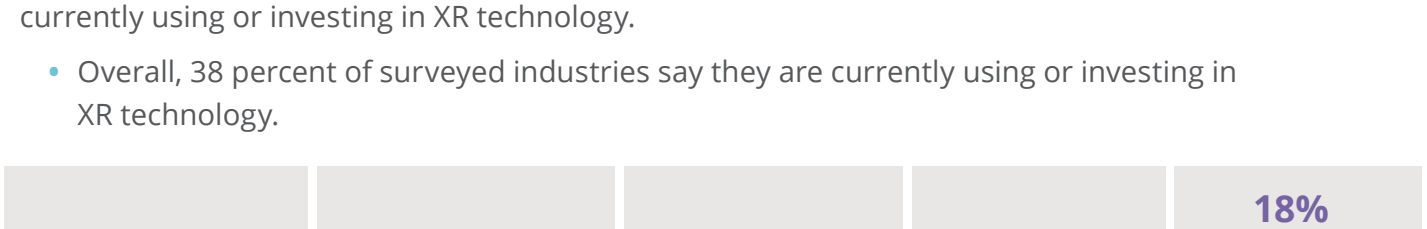
Business leaders see myriad opportunities for XR technology to help their organizations recover from the economic and business disruptions of the COVID-19 pandemic, primarily through learning and training.*

- Sixty percent said better learning and training outcomes due to immersive learning experiences is one of the ways XR could help, and 18 percent said it was the primary way XR could help enterprises recover from the pandemic.
- Fifty-nine percent said XR could expand distance learning and training and 14 percent said it was the primary way XR could help.
- Fifty-seven percent said XR could "enable better communication and collaboration among employees and/or contractors, customers, patients," while 12 percent said it was the primary way XR could help.
- Fifty-five percent said XR could enhance the customer or patient experience and/or customer service and 13 percent said it was the primary way XR could help.

*Respondents were asked to choose three ways XR technology could help their organizations and were asked to identify their top choice as well.

Business leaders report growing adoption of XR technologies, with manufacturing and retail leading the way in current use and/or investment.

- Fifty percent of manufacturing business leaders and 49 percent of retail business leaders say they are currently using or investing in XR technology.
  - Overall, 38 percent of surveyed industries say they are currently using or investing in XR technology.



- Three in four business leaders said they believe their organizations will spend more on XR technology over the next five years, with manufacturing, job training and retail leading.

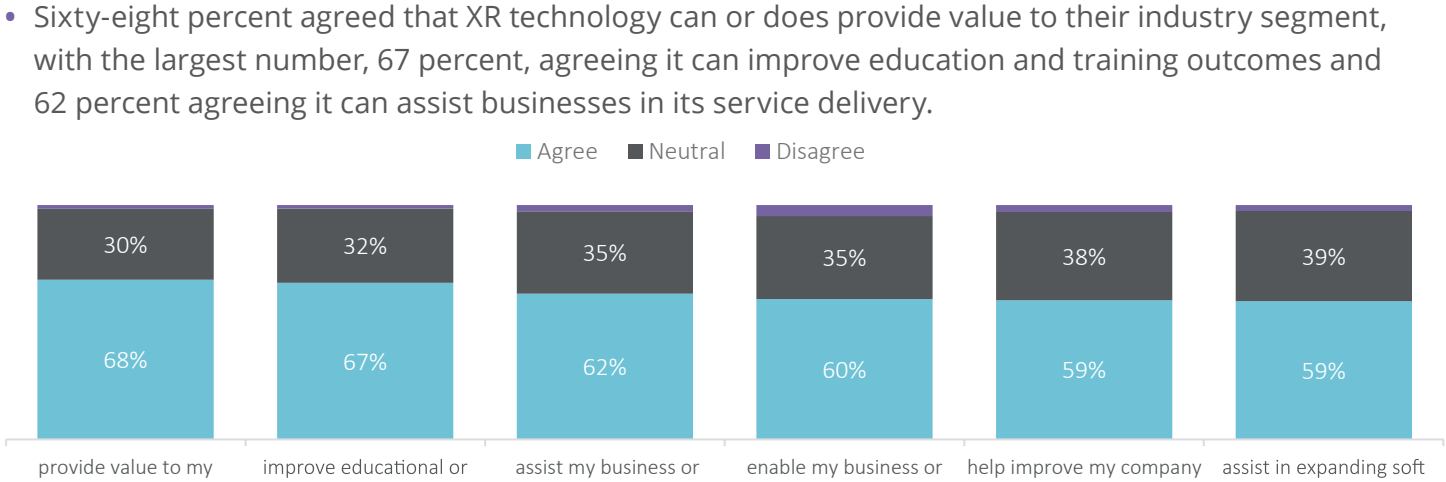
KEY FINDINGS OF THE SURVEY (CONT.)

Business leaders are broadly optimistic about the future of XR technologies in their industry sector and believe that the benefits of XR technology will provide value to their sector.

- Ninety-four percent overall believe XR has useful applications for their industries, with retail, job training and public safety leading.

97%	96%	95%	94%	93%	88%
Retail	Job Training	Public Safety	Education	Healthcare	Mufacturing

- Sixty-eight percent agreed that XR technology can or does provide value to their industry segment, with the largest number, 67 percent, agreeing it can improve education and training outcomes and 62 percent agreeing it can assist businesses in its service delivery.



[q23] How much do you agreeo r disagree with each of the following future-lookings tatements?
BASE: (Total: N = 750)

KEY FINDINGS OF THE SURVEY (CONT.)

- When asked which industry they believed would be at the forefront of adopting XR technology, each industry sector overwhelming picked themselves.



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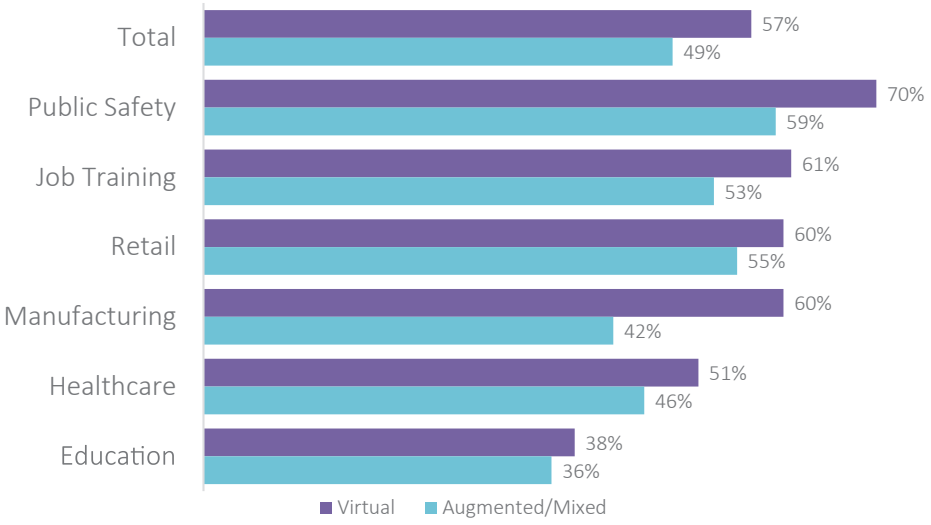
- Forty-nine percent said one way the government could help was in funding research and development.
- Forty-five percent said the federal government should prioritize XR as a "critical" technology, along the same lines as it has for artificial intelligence, 5G wireless technology, and quantum computing.
- Forty-five percent said the federal government should utilize XR within federal departments and agencies.
- Forty-three percent said the government should develop regulations for XR.
- Twenty-nine percent said the federal government should offer tax incentives to companies that use XR at enterprise scale.

**Respondents were asked to choose all options that they believed would apply to the federal government's role.

KEY FINDINGS OF THE SURVEY (CONT.)

Most business leaders surveyed are using VR, AR and/or MR in their personal lives, and many are likely to consider purchasing such technology for personal or family usage.

- Fifty-seven percent of respondents said they use VR technology in their personal lives, while 49 percent they use AR/MR applications.



XR ASSOCIATION 2020 [q28] Do you use VR technology in your personal life? [q29] Do you use AR/MR technology in your personal life?
BASE: (Total: N = 750;Job Training: N = 125;Retail: N = 125;Manufacturing: N = 125;Healthcare: N = 125;Education: N = 125;PublicS afety: N = 125)

- Sixty percent of business leaders said they are likely to purchase AR or VR technology for personal or family usage in the upcoming holiday season.

While business leaders are enthusiastic about the potential of XR technology for their businesses, real and perceived barriers to adoption remain, particularly in the current pandemic environment where budgets, particularly for public safety and education, have been stretched or reduced.

- Potential costs led business leaders' concerns about XR technology adoption with 26 percent choosing it as a top factor.
- Twenty-three percent selected lack of knowledge about the application of XR technology to a respondent's industry sector as their top factor, and 11 percent chose reluctance to learn or use new technology.

KEY FINDINGS OF THE SURVEY (CONT.)

- Other factors included lack of availability of software solutions to meet their business needs (10 percent first choice); data security and privacy concerns (8 percent first choice); physical and online safety concerns (6 percent first choice); lack of availability of headset equipment (6 percent first choice); physical comfort of headsets (7 percent first choice); and accessibility of XR technology for disabled community (4 percent first choice).

CONCLUSION

Business leaders see an expansive future for XR as a business tool to both assist them with the current economic and social conditions forced on them by the COVID-19 pandemic and to push their businesses into the future. Despite some of the challenges they perceived to adoption of the technology in the near term, these leaders strongly believe XR is part of the solution for businesses, not a problem.

XR Association members recognize that this moment in history requires them to demonstrate leadership and do everything it can to both support public health responses as well as business continuity during the pandemic. To that end, the XR is working hard to inform businesses about the current options for XR enterprise solutions as well as lay the groundwork for the next generation of XR tools that will be needed once our country enters a full economic recovery and beyond.

ABOUT THE XR ASSOCIATION

The XR Association promotes the dynamic global growth of the XR industry, which includes virtual reality, augmented reality, mixed-reality, and future immersive technology. XRA is leading the way for the responsible development and adoption of XR by convening stakeholders, developing best practices and research, and advocating on behalf of our members and the greater XR industry. Association members represent the headset and technology manufacturers across the broad XR industry, including Google, HTC Vive, Facebook and Oculus, Microsoft, and Sony Interactive Entertainment. Learn more at xra.org.

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