



Driving Experience and Efficiency with Extended Reality



Extended reality (XR) – encompassing augmented reality (AR), virtual reality (VR) and mixed reality (MR) —is a thriving force founded on fourth wave computing power, that integrates sensors, big data, the cloud, artificial intelligence (AI), and wearables.

It's also a disruptive force, changing the way people perceive and interact with the digital world. This combined shift in perception and interaction is paving the way to more interactive user experiences, which have the potential to encourage growth across technological realms, including IoT, data visualization, and virtual personal assistants (VPAs). These changes can be made even greater by coupling XR with machine learning (ML) and artificial intelligence (AI) to increase personalization and contextualization.



Reports suggest that interest is growing for AR and MR. Immersive experiences have been listed among Gartner's Top 10 Strategic Technology Trends for 2019,¹ which claims that by 2022, 70% of companies "will be experimenting with immersive technologies for consumer and enterprise use," with 25% already deployed to production. This predicted growth is attributed to the maturity and accessibility of immersive technology, as well as the falling costs of hardware, and the influx of research and success stories pointing toward the power of immersion.

The anticipated result of this growing interest is a very fruitful and very disruptive industry. Goldman Sachs Research predicts that the AR/MR industry will be worth \$80 billion by 2025², and according to the World Economic Forum's "The Future of Jobs Report: 2018": "By 2022, no less than 54% of all employees will require significant re- and upskilling."³

With the rapid growth of XR, AI and ML industries are exploring solutions to address challenges related to rapidly changing business models, and empowering employees with modern technical skills.

The IDC anticipates some of the largest commercial use cases for these technologies in 2019 will be training (\$1.8 billion), online retail showcasing (\$5.8 million) and industrial maintenance (\$413 million). Several other commercial use cases (lab and field, anatomy diagnostics, and internal videography) are forecast to see CAGRs greater than 100% over the forecast period.⁴ Besides the logical interest from an end-user perspective, analysts agree that the use of AR and MR with hands-free devices will help increase productivity in an enterprise environment.



Where do enterprises find value?

Many industries are looking to identify potential areas of application for AR within their operations and service functions. Businesses that are already experimenting with the technologies are finding it helpful in aiding productivity, collaboration and user satisfaction in previously unexplored areas.

Sales & Marketing

AR and MR offer many opportunities to enhance customer experience. The modern customer is looking for ways to better integrate products into their daily routines, creating an opportunity for entrepreneurs to offer product solutions that help consumers streamline various aspects of their lives. XR can enable customers to virtually explore products, experience them in real-life scale, understand different features, and customize products in their environment before deciding to buy. This is a win-win for consumers and entrepreneurs: consumers benefit from better customer experiences, and entrepreneurs benefit from XR directly addressing the growing challenge of customer retention.

Training

It is believed that MR-based training programs can reduce training time by 40% and improve employee performance by 70%, compared to traditional training. MR is emerging as a training superpower, because it combines three important components: immersion, presence and empathy. An XR headset creates a virtual environment and immerses the trainee in it, giving them the sense of being physically present, and prompting their brain to absorb information as if they were. XR puts users in other people's shoes, promoting empathy-driven changes in attitude and behavior, like understanding and patience. If the environment is convincing enough, trainees can also form lasting spatial and muscle memories that carry over into the real world.

Operations

The unique properties of XR can increase productivity across a range of industries. For example, immersive technology is being used to streamline workflows, improve efficiency and safety, and to help manage the complexity of tasks.

In industrial plants and fields, AR and MR will give operators and technicians the ability to better interact with the environment. XR can help keep contextual information at hand, empowering technicians to execute troubleshooting and maintenance work at faster speeds, lower costs and higher quality, ultimately improving first time resolution rate and customer satisfaction.



Enterprise Adoption of XR

The following industries are likely to be among the earliest adopters of XR, due to the obvious potential for business-enhancing applications in daily operation and the ease of integration.

Healthcare

Extended reality has potential to enhance all areas of the healthcare industry, reaching health care providers (HCPs), payers, consumers, and pharmaceutical companies:

- For HCPs, XR can help patients prepare for surgery by offering insights on the procedure, and help them post-surgery, with rehabilitation, by providing psychological support and telemedicine.
- For Payers, XR can be used to enhance customer support, provide product information and speed up case processing.
- For pharmaceutical companies, XR can help increase productivity, enhance customer support, provides product information and adverse event case management.

Manufacturing

XR is being adopted throughout manufacturing, paving the way for “digitally connected” factories in line with industry 4.0 goals. AR/MR can be used for plant layout planning, operator and safety training, and maintenance and repairs. It can also be used for production support, overlaying information whenever and wherever needed. These technologies also have a wide range of applications in product design.

Retail

Market leaders like Ikea, Walmart, and Lowe’s have already adopted XR, and are increasing its popularity through their widespread use of the technology in various business cases, including:

- End users — for product discovery and suitability. AR helps end users make informed decisions, reduces the chances of product return, and enhances user shopping experience.
- Large stores — for promotions and navigation. AR can be used to overlay offers and discounts while helping customers find their way around.
- Product customization and comparisons.

Energy and Utilities

XR has a lot of potential for application in, and modernization of, the energy and utilities sector, and is witnessing huge investments by large firms.

- XR can be used for virtualization of sub-surface earth models, to view the reservoirs, geological formations, and seismic information while on-the-move.
- Operators and engineers can be trained in operation and maintenance of equipment and plants without exposure to hazardous environments or scenarios.
- XR can help reduce accidents by providing better visualization of underground assets and complex components.
- Remote collaboration with experts in remote areas can save time and money.

Logistics

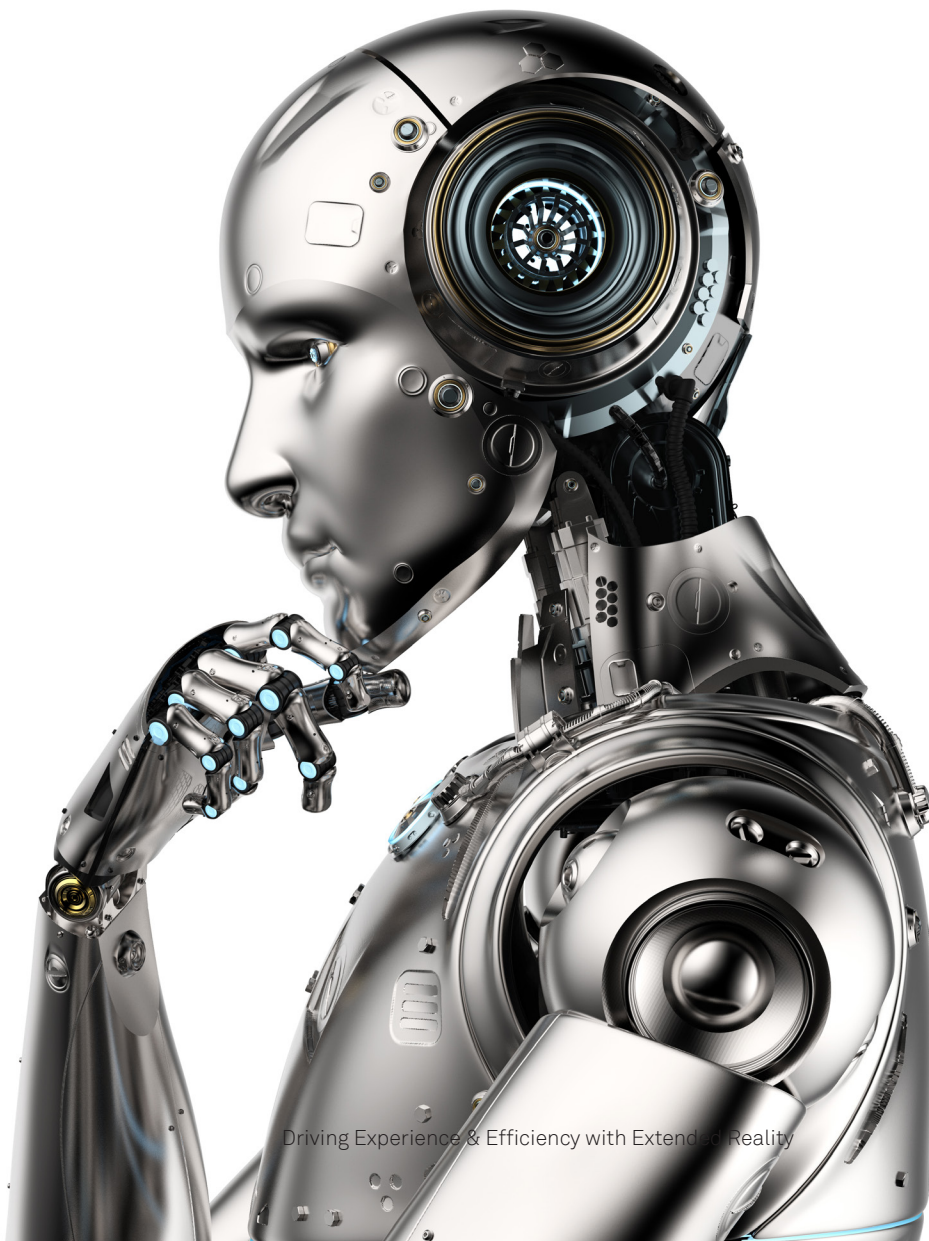
XR also has the potential to increase productivity in warehousing and transport by optimizing processes across the entire supply chain.

- An employee in a warehouse can optimize operations by using overlaid goods information in the order picking process.
- Extended reality can help in reverse logistics by segregating goods, providing on-the-go assessment of returned goods, and by suggesting actions to optimize the returns process.
- Delivery of goods can be optimized by interactive and informative navigation, greatly improving last meter delivery.

Banking

Widespread integration of XR-enabled devices, and the increased number of millennial consumers, are two key factors that will compel the banking industry to adopt to these new technologies, with advantages ranging from greater security to increased usability.

- XR can assist people with the use of biometric sensors for authentication and overlaying information about their bank account, loan transactions, etc.
- Banks can optimize operations by setting up smaller branches that provide virtual support for a range of activities (customer onboarding, account services, investment advice, insurance product advice, answering user queries, handling various service requests).



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Conclusion

Many major enterprises have already begun exploring extended reality and its potential as a smarter alternative to traditional means of doing business. By investing in and adopting these emerging technologies, industry leaders are modernizing their processes, optimizing their resource utilization and increasing efficiency on nearly all levels.

At the same time, manufacturers of smart vision-wear are constantly developing new devices with better vision, connectivity and ergonomics, increasing integration across industries at a rapid rate, and making products more affordable and user friendly for consumers. The usefulness of XR is becoming more and more apparent, particularly to those industries exploring the full reach of this new technology, which is already generating new business opportunities and providing early adopters with a real competitive edge.

About the authors

Vijay Garg

Vijay is the Technology Practice Head with Interactive Experience (iX) practice at CTO, Wipro. He has over 20 years of experience in dealing with CXO level clients across Fortune 100 organizations and expertise in technology innovation, digital transformation and customer experience enhancement. His responsibilities include practice development, pre-sales, digital transformation, and strategy & planning.

Kartik Subodh Ballal

Kartik is a Digital Transformation Consultant with Interactive Experience (iX) practice at CTO, Wipro. He has 13 years of experience in digital technologies and is responsible for innovation in emerging technologies, consultation, solution design, pre-sales and market research.

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¹ www.gartner.com/en/newsroom/press-releases/2018-10-15-gartner-identifies-the-top-10-strategic-technology-trends-for-2019

² www.goldmansachs.com/insights/pages/technology-driving-innovation-folder/virtual-and-augmented-reality/report.pdf

³ www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

⁴ www.idc.com/getdoc.jsp?containerId=prUS44511118

⁵ www.forbes.com/sites/solrogers/2019/05/09/how-vr-ar-and-mr-are-making-a-positive-impact-on-enterprise/#62643ef65253