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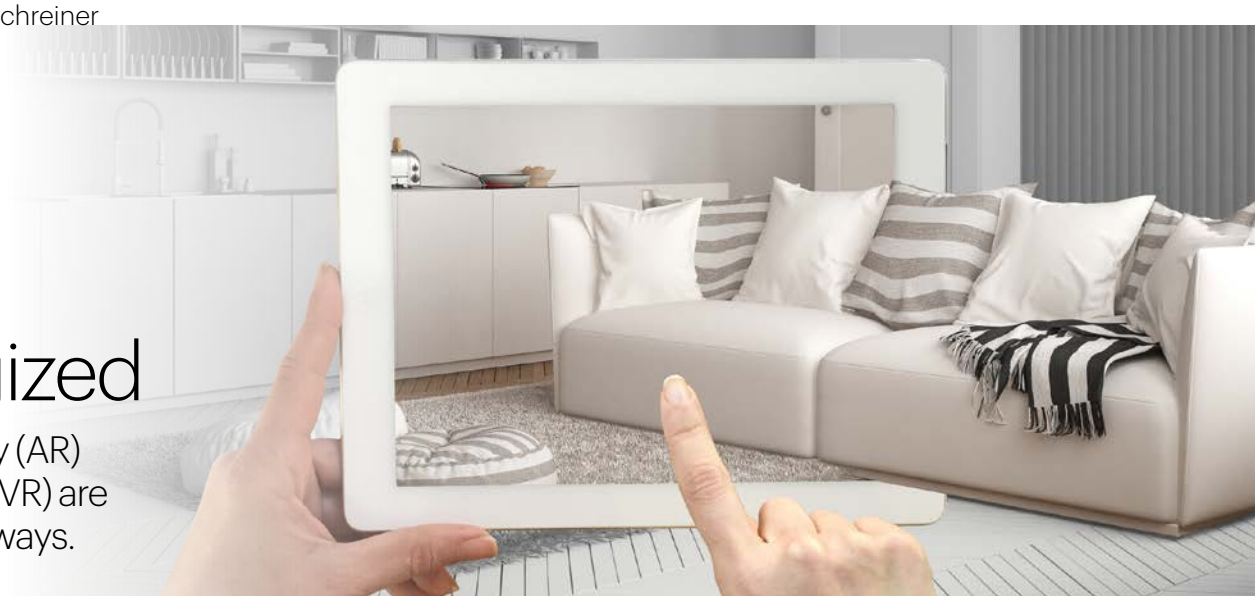

VR, AR: Reenergized

Augmented reality (AR) and virtual reality (VR) are emerging in new ways.

Who can forget the fanfare when AR and VR first launched focused on futuristic entertainment experiences — Google Glass, the cardboard VR viewer or the first Oculus Rift, HoloLens? The AR/VR market is now forecast to grow from $13 billion in 2020 to over $67 billion by 2024, according to Digi-Capital.

The evolution of these technologies highlights their diverse use cases. AR delivers a modified view of the real physical world while VR delivers a unique experience in a virtual world. AR provides computer-generated context and information about the world letting users interact with 'real' surroundings. While VR allows users to interact with immersive worlds enabling people to learn new skills through simulation. For now, VR's entertainment focus makes it a subset of the consumer games market, with VR apps on Steam, FaceBook/Oculus and Sony app stores.

Mobile AR

During the pandemic, mobile AR showed what is possible for AR-enabled messaging platforms with Facebook Messenger, Instagram, TikTok and Snapchat as examples. While each has a different approach to user engagement, usage frequency for AR lenses and filters is high, with Snap claiming more than 170 million users daily, based on its June 2020 Developer Conference. Smart glasses with integrated displays may be coming soon — fully computer capable yet lightweight, stylish and wireless. Other form factors in the works include smart contact lenses.

Digi-Capital forecasts that messaging-based mobile AR's active installed base will top 1.5 billion by 2024, OS-based mobile AR over one billion by 2024, followed by web-based mobile AR. All mobile AR platforms combined could top 2.7 billion in five years. Many companies are involved in this space including:

- **Nintendo-Niantic** agreed to jointly develop apps featuring AR aimed at providing real-world activities for players. The companies are introducing an app based on the puzzle video game franchise Pikmin. Launching this year, it includes activities to "make walking more delightful."
- **Apple** reportedly has an AR/VR research team working on projects that could be implemented into future iOS devices including a headset or AR smart glasses to be released in 2022. Apple has a stable of AR and VR patents, and expertise gained through acquisitions including Akonia Holographics, Emmotient, Faceshift, Flyby Media, Metaio, NextVR, PrimeSense, RealFace, Spaces and Vrvana.
- **FaceBook Reality Labs** is developing a wrist-based wearable interface for AR glasses using software that can read nerve impulses. Developed by CTRL-Labs, acquired by Facebook in 2019, the work is part of research into human computer interaction technologies. This could lead to AR glasses as an always-accessible, reliable neural interface with subtle hand motion controls that may potentially replace keyboards or TV remotes.
- **Google's** Earth VR puts the world at your fingertips. Its Tilt Brush enables you to paint in 3D space with VR and is compatible with Oculus and HTC Vive.

Reimaging Digital Shopping

In May 2020, Kohl's collaborated with Snapchat to create Kohl's AR Virtual Closet. Using a smartphone and the Snapchat app, consumers enter an AR dressing room, mix and match items, and make a purchase from home using the app.

Retailers like IKEA and Wayfair have AR apps that display how furniture would look in your home. Louis Vuitton and Gucci offer apps that let consumers 'try-before-you-buy' from home. And when COVID-19 temporarily closed Kendra Scott jewelry brand stores, the retailer introduced an AR tool letting customers virtually try-on jewelry at home and then purchase. Beauty retailers Sephora and Ulta are using AR to help customers digitally test beauty products since customers can't physically test instore currently.

These are just a few applications but health care also holds enormous promise. Opportunities in this new ecosystem including new developers, suppliers and channels will grow as AR/VR uses continue to evolve. ■