

MAGIC LEAP

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Annotation. Magic Leap is a leader in AR and MR technologies. Initially focused on consumer AR, its first headset received mixed reviews. In 2020, the company pivoted to enterprise markets, targeting healthcare, manufacturing, and defense. Magic Leap 2 introduced a larger field of view, enhanced processing, and enterprise connectivity. Looking ahead, the company continues to refine AR hardware, integrate AI, and expand industry applications.

Keywords: Magic Leap, augmented reality, mixed reality, artificial intelligence, design, health.

Introduction. Magic Leap is a company in augmented reality (AR) and mixed reality (MR) technologies. Founded in 2010 by Rony Abovitz, the company was set out to create a groundbreaking AR headset that would revolutionize human-computer interaction [2, 4]. Magic Leap's technology integrates digital content into the real world, enabling immersive 3D experiences through spatial computing and light-field displays. From its inception, Magic Leap adopted a strategy of secrecy, building anticipation around its innovations. The company attracted substantial investments from major players such as Google, Qualcomm, and Alibaba, raising billions of dollars to develop its proprietary AR technology [4].

Main part. In 2018, Magic Leap released its first AR headset, the Magic Leap One, aimed at developers and content creators. The device featured a spatial computing platform and a light-field display to overlay digital objects onto the real world. However, despite its technological advancements, the product received mixed reviews, with praise for innovation but criticism for bulkiness, limited content, and an underwhelming user experience [3].

After the release of Magic Leap One, the company struggled to gain traction in the consumer market. The high expectations for mass adoption were not met due to technical limitations and a lack of compelling AR applications [3]. As a result, Magic Leap pivoted in 2020, shifting its focus from consumer applications to enterprise and industrial markets. This rebranding positioned the company as a provider of business solutions in fields such as healthcare, retail, manufacturing, and defense. In 2022, the company introduced the Magic Leap 2 (depicted in Figure 1), a substantial advancement in augmented reality headset technology, specifically tailored for professional and enterprise applications [1]. This device incorporated several key enhancements, notably an expanded Field of View (FOV) that provided users with a significantly larger visual area, thereby increasing immersion. Furthermore, the Magic Leap 2 boasted a lighter and more powerful design, making it more practical for extended use in demanding professional settings. Finally, the headset featured advanced spatial computing capabilities, enabling real-time interaction with 3D digital objects within the user's physical environment [1].



Figure 1 – The Magic Leap 2

The Magic Leap 2 headset is engineered with a powerful processing architecture, incorporating a 14 Core Custom Computer Vision and Image Processing (CVIP) Block, 6 Vector Computer Vision/Machine Learning Cores with 4MB SRAM, 2 Dedicated Machine Learning Cores, and 6 ARM A55 Cores with 1.28MB SRAM. For storage, it utilizes 256GB of high-bandwidth, low-latency 2-lane NVMe storage, ensuring rapid read and write speeds. The device is equipped with 16GB of onboard LPDDR5 5500 RAM (128-bit), facilitating the execution of demanding augmented reality applications with speed, smoothness, and efficiency. Connectivity is robust, supporting streaming at 2.4 Gbps, Wi-Fi 6, and direct CAT5 Ethernet cable, with the added flexibility of 5G mobile hotspot support for field operations. In terms of power, the Magic Leap 2 features an integrated battery that provides up to 3.5 hours of operational use and extends to five hours of standby time when Battery Saver mode is activated [2].

The versatile applications of Magic Leap technology have permeated numerous industries, demonstrating its transformative potential. In the healthcare sector, it facilitates medical training, surgical planning, and the real-time visualization of anatomical structures, enhancing precision and understanding. Within manufacturing and design, it empowers engineers and designers to create and manipulate 3D models and prototypes within an immersive environment, streamlining development processes. In defense and military applications, partnerships with companies like Lockheed Martin enable sophisticated battlefield simulations and mission planning. Furthermore, in retail and training, Magic Leap technology aids businesses in crafting interactive customer experiences and developing engaging employee training programs [1, 4]. Magic Leap's early strategy of secrecy was intended to generate excitement and protect intellectual property from competitors. This approach was instrumental in attracting investors and positioning the company as a leader in AR innovation. However, the lack of transparency also contributed to skepticism when the first-generation product did not meet the high expectations set by the company's marketing.

Looking forward to 2025, Magic Leap is projected to maintain its strategic emphasis on enterprise-focused augmented reality solutions. Several key trends are anticipated to shape its trajectory [1]. These include an expansion into AI-driven AR, where artificial intelligence will be integrated to create smarter and more adaptive user experiences. A wider adoption of Magic Leap technology is expected in the healthcare and defense sectors, marked by increased collaborations with medical institutions and military organizations. Concurrently, there will be a refinement of AR hardware, with a focus on developing lighter and more compact headsets that feature improved Field of View (FOV) and enhanced processing power. Finally, the growth of the software ecosystem will be prioritized, with efforts aimed at expanding developer support and establishing a robust marketplace for AR applications.

Conclusion. While Magic Leap has moved away from direct consumer products, it remains a key player in shaping the future of spatial computing. With its continued innovation and partnerships, Magic Leap's technology may redefine industries and pave the way for more sophisticated AR experiences in the coming years. Magic Leap will likely continue to work on reducing the size and weight of their devices to make them more comfortable to use for long periods of time. They will continue to develop their Lumin OS platform and Lumin SDK to attract more developers and build an app ecosystem. They also plan to continue to expand their presence in international markets, especially in regions where AR technology is actively developing, such as Asia and Europe. While Magic Leap is currently focused on the enterprise segment, the company may return to the idea of creating devices for the masses in the future, especially if the technology becomes more accessible and convenient. As AR technology advances, Magic Leap will likely pay more attention to user privacy issues and the ethical aspects of AR use.

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