AR/VR: Making a Difference in The Business World

White paper

Executive Summary

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Scientists have always been toying with new ideas in a quest to create technology-driven immersive and interactive experiences for humans. Recently, gaming companies pushed new boundaries in pursuit of making their games more engaging for users. VR started gaining more attention when Meta, formerly known as Facebook, pioneered one of the first VR headsets in the form of Oculus Rift. Meanwhile, AR also began to take off after Boeing engineer, Tom Caudell, used it to describe a digital display system used in aircraft assembly.

But where lies the true power of AR/VR? Is it merely confined to gaming and engineering?

The answer is an obvious no. There are a few reasons for this. Firstly, the time is ripe for AR/VR to go mainstream because technology – both software and hardware – is mature enough to support it. Secondly, ancillary services such as high-speed broadband, 5G and LCD/LED developments used to bring AR/VR to life are not only readily available but advanced enough to make AR/VR realistic.

But perhaps the greatest driver, few would have thought would encourage AR/VR to become mainstream is the global Covid-19 pandemic, which we went through these past three years. The pandemic has accelerated the adoption of these immersive technologies, underscoring their ability to address critical challenges and open new avenues for innovation.

Simply put, AR and VR technologies offer transformative capabilities in corporate business, enabling improved communication, training, marketing, and customer engagement.

Acknowledging this, TM Research and Development (TM R&D) is looking to identify appropriate integration opportunities for the implementation of AR/VR and adopt more projects with AR/VR prospects.

This paper seeks to explore the definitions of AR/VR, its business potential and its current applications in the present world. While challenges exist, embracing these technologies will position businesses at the forefront of innovation, providing a competitive edge and creating significant value in an evolving business landscape.

Introduction to AR/VR

The world has gone through a revolutionary change over the past three years. Due to Covid-19, the business world was forced to keep its workforce primarily at home. The sudden global adoption of the digital world in the corporate working environment caused several challenges. This included maintaining worker productivity and ensuring effective communication between employer and employee.

Remote workers found it difficult to reach out or to understand their assigned tasks effectively. This was made worse as facilities and references usually available to them physically were no longer accessible to them. Collaboration between team members proved to be more challenging than before, productivity levels dropped due to lack of motivation, and employees' mental health deteriorated as a consequence of social isolation.

In these cases, AR/VR are two revolutionary technologies that have been identified to help alleviate these concerns by creating a virtual space that can simulate a traditional working environment.

There is an unforeseen marketability in the capabilities of AR/VR, thus why AR/VR has garnered significant attention from both businesses and investors. According to research, the global market for AR is expected to reach US$71.2 billion by 2028 up from US$25.1 billion in 2023, with a CAGR of 23.2% during that period. And the global VR market is expected to reach US$29.6 billion by 2028, up from US$12.9 billion from 2023, with a CAGR of 18%.

The financial possibilities brought by these two technologies are more profound than initially expected, spanning from advertising to education to data visualisations. It is firstly important to make the distinction between AR and VR.

Augmented Reality

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AR blends digital elements with the real world, offering intuitive guidance in various applications. AR's accessibility, primarily through smartphones, has made it a versatile tool that has found applications in education, marketing, and gaming. It utilises sensors, cameras, displays, machine learning, and gesture tracking to overlay digital information in the real world.

The creative possibilities of AR could be limitless as it is already widely accessible and it has the potential to completely reform conventional industry practices, especially in the marketing realm. AR makes use of technologies that are already owned by the general population, namely the common smartphone. It is universally accessible by users and they can easily reap its benefits via AR apps.
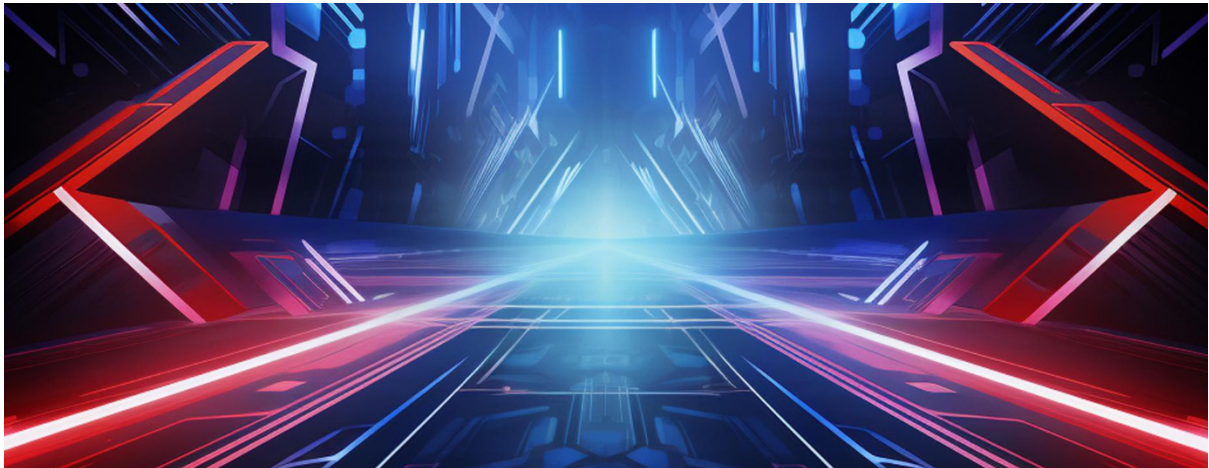
Where is AR being used?

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Today, there are already AR applications being used in the industry, particularly in education, marketing and gaming.

Ikea's Place App or Home Depot's Project Colour App, allows shoppers to use AR to help them visualise everything from furniture design, colour and dimensions, among other things, to help them decide on their purchase. By enabling a new, exciting and more intimate way to interact with products, customers' interests will surely peak further.

The key to capturing a customer's interest is not necessarily the quality of the product but rather how it is marketed. Innovating one's e-commerce platform as described above will increase a company's competitive advantage over others that use traditional platforms.

Virtual Reality

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VR differs from AR in the way that it leans solely on the digital environment rather than sharing the elements in the physical world. VR immerses users in a digital environment, replacing the physical world entirely. As such, VR completely replaces the user's environment with a digital one. VR's business potential is a broad one, as it spans various industries, including automotive design and corporate meetings, but its full potential is yet to be realised.

The end goal for VR is complete immersion but to do so effectively, both hardware and software capabilities can cost beyond what is affordable by the general public. To make VR widely acceptable and used, the industry needs to be able to cater to a wide range of demographics having different budget considerations.
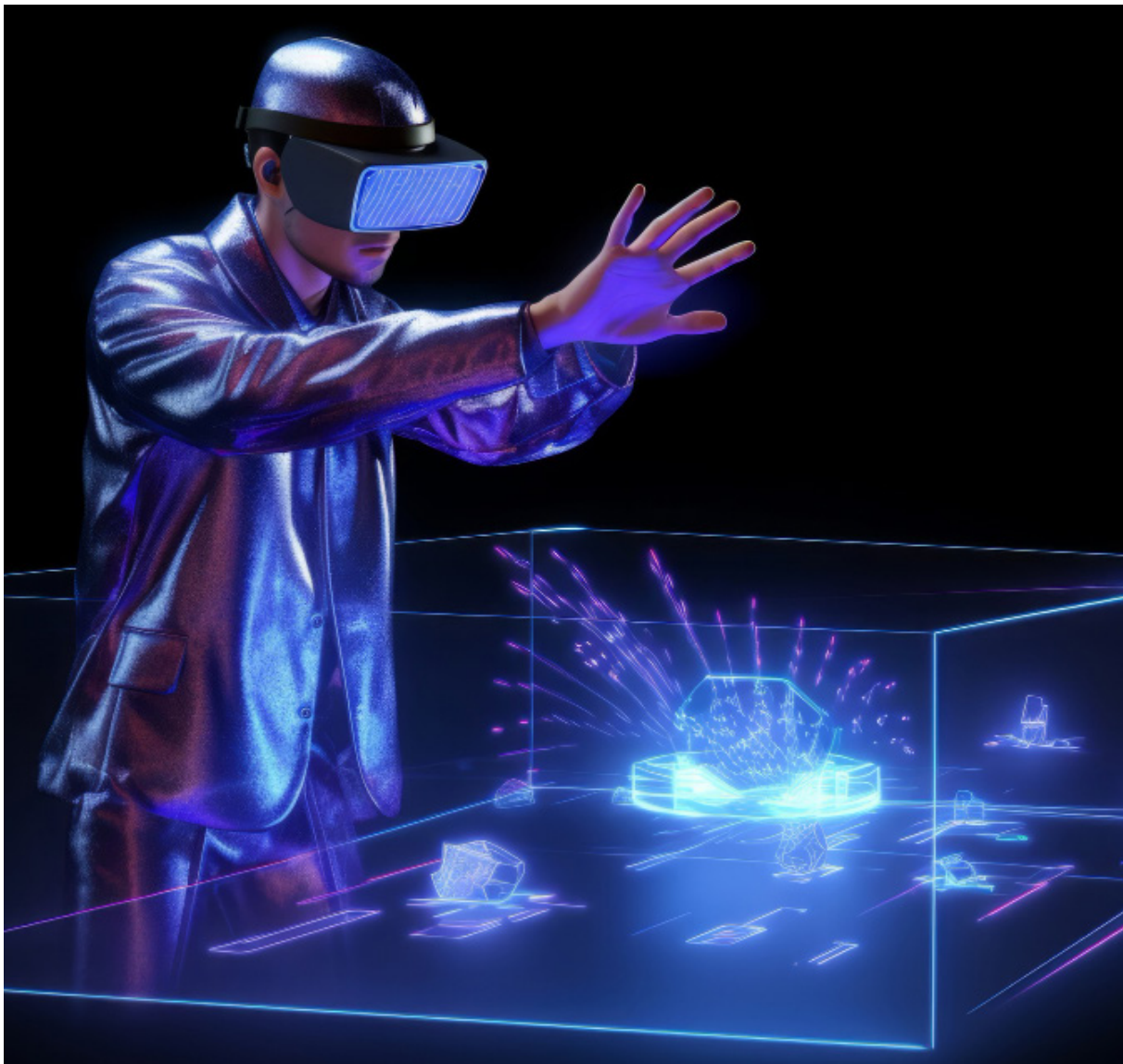
Where is VR being used?

One pioneering example would be the world of the Metaverse, currently being developed by its namesake, Meta, previously known as Facebook. Metaverse is envisioned to be a digital space where netizens are able to play, shop, work and interact freely with each other while being able to jump from one world to another – all from the comfort of their own homes.

But this vision is far from a reality as yet because there are still interoperability issues between different platforms and devices. This is an impediment to adoption and is not easily overcome; today Meta has not yet been successful in this venture. Still, VR has the potential to completely revolutionise the connection between Internet users, digital ownership and e-commerce.

NFTs, an extension of VR

When the interoperability between Metaverse is successfully constructed, and it is capable of enabling quick world-hopping in an instant, the Metaverse can provide users with the opportunity to have digital ownership of virtual items. This can range from avatar customisations, such as clothing and hairstyles, to actual virtual lands, akin to virtual real estate.

In order to adopt this system of digital ownership and enable the users to equip or "own" these items throughout multiple digital worlds, a system known as Non-Fungible Tokens (NFTs) is being proposed.

NFTs allow digital items to have identification and controlled access. This opens up the possibility of a digital market completely fuelled by virtual items, thereby giving way to a completely new, untapped realm of digital retail and asset ownership ripe for business opportunities.

AR/VR Application by TM R&D

Seeing how the integration of AR and VR is integral to the pursuit of constantly adapting to a dynamic modern environment, TM R&D has taken up the challenge to incorporate the AR/VR platform in projects and in some areas of marketing as well.

TM R&D does this by exhibiting the products through an exciting immersive and interactive experience. Throughout our research, we discovered massive advantages when we embedded AR/VR into our advertising of the products we designed as part of TM R&D's overall marketing strategy.

One example of this can be seen in TM R&D's initiative to showcase 6 of the company's products in a virtual space environment. Upon access, the user is transported into an exact digital replica of TM R&D's building which will then allow access to different rooms, true to its physical counterpart. The key highlight of this virtual environment is the showroom where TM R&D's main products are displayed.

Inside the showcase room, all key products are made available for visitors to browse through and explore. This virtual space can be accessed simply by using a laptop and a link provided by TM R&D or wearable devices.

This innovative method of advertising TM R&D's products leverages AR/VR technologies to create immersive and interactive experiences for customers. Whether it's showcasing products in a virtual showroom or providing step-by-step guidance for complex tasks, AR/VR enhances the user experience and boosts engagement to unprecedented levels.

With AR/VR for guidance, customers can interact with digital representations of our products, helping them to gain a deeper understanding of their features, functionalities, and potential use cases. The technology enables businesses to overcome geographical barriers by offering remote assistance and virtual demonstrations, thereby reducing the need for in-person interactions.

Moreover, the personalised and interactive nature of AR/VR experiences fosters stronger brand loyalty and customer satisfaction, as users can explore products at their own pace and convenience.

Another vertical that benefits from this is the telecommunications industry. For example, service restoration of fibre optic networks is known to be a critical yet intricate process. There is a pain point in the process of locating manholes and pinpointing fibre breakdowns relies heavily on manual intervention, often necessitating the excavation of multiple manholes.

Considering this, TM R&D adopted an AR technology solution in a project which helps users determine fibre routes, entrances and other network elements. The project makes use of camera lenses to visualise manhole and underground fibre routes, which are then projected to a user that is typically on ground level.

The user will have a more accurate view of the fibre optic cables and all other required information such as cable size and join type from ground-level, therefore speeding up the restoration process, enabling TM to meet the Service Level Agreement (SLA) and ultimately surpassing customer satisfaction expectations.

Technicians equipped with AR/VR tools can quickly pinpoint faults and perform repairs accurately, minimising downtime and network disruptions.

The possibilities of AR/VR is limitless and going forward, it will be wise to plan future prospects with consideration to how AR/VR can be part of the solution.

Conclusion

AR/VR technologies have emerged as transformative tools in the corporate business world, offering new ways to communicate, collaborate, train, market, and engage customers. The benefits of AR/VR, including enhanced communication, advanced training, innovative marketing, and improved customer experiences, have the potential to drive growth, efficiency, and innovation across diverse industries.

Despite challenges such as technological limitations, privacy concerns, and user acceptance, the integration of AR/VR into corporate operations is poised to become a critical factor for success in the future. By embracing these technologies, businesses can position themselves at the forefront of innovation, gaining a competitive edge and creating significant value in the evolving business landscape.

Creator of Smarter Ecosystems for a better Malaysia

Established in 2000, TM R&D is the innovation arm for TM Group focusing on creating smarter ecosystems to make business and life easier for a better Malaysia. TM R&D's solutions are clustered around four (4) pillars namely Intelligent Platforms, Data Brokerage, Connectivity/Tools and IR4.0/Digital Solutions.

Growing from strength to strength since 2016, TM R&D has won multiple global awards and generated more than 2,800 Intellectual Property Rights (IPRs) and 1,400 digital assets to-date.

TM R&D's innovations are all developed in-house and cut across multiple verticals such as Utilities, Retail, Agriculture, Healthcare and Education with safety and productivity as the top priority.

As TM R&D continues to expand beyond connectivity and into smarter digital ecosystems, its role in TM has become more prominent and exciting.

We are looking for remarkable people to join us. People who are courageous enough to push boundaries, curious enough to experiment with new technologies, and who have the determination to drive new ideas forward. A new opportunity awaits you here in TM R&D.

Be a part of our family at https://www.tmrnd.com.my/jobs/ or email recruit@tmrnd.com.my

For more information about TM R&D and its products and services, visit
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