Powering the Business Metaverse: The Case for ThinkReality
為商用元宇宙作好準備：Lenovo ThinkReality 應用個案

Lenovo ThinkReality Helps Customers Scale into the Next Big Wave of Computing
Lenovo ThinkReality 設備助客戶投入下一個運算熱潮

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The infrastructure for the next big wave of computing is being imagined and built right now — and it's called the Metaverse. Simply put, the metaverse is an immersive virtual world where many people come together to work, play, and socialize. It's the next big step in the evolution of the Internet toward Web 3.0 and is already gaining positive traction among people. Research commissioned by Lenovo revealed that almost half of the employees (44%) were willing to work in the metaverse and believed that it could deliver benefits like better productivity in the workplace.

So what will working in the metaverse look like? Currently, the popular vision is a real-time 3D spatial map of the real world, virtual places (think virtual real estate), and things imagined and built by creators empowered by decentralized blockchain protocols, non-fungible tokens (NFTs), and cryptocurrencies. The metaverse will enable all the information in the virtual world persistent, shared, and accessible for multiple users and devices. Such devices include high-fidelity augmented reality (AR) and virtual reality (VR) devices and applications.

It is, however, essential to note that this vision of metaverse is not here today. No road signs, URLs, or even a red pill will get you to the Metaverse, especially in the current working environment. And many employers have yet to reimagine their workplace in the metaverse. In the Lenovo survey, 43% of the respondents believed their employers do not, or probably do not have the knowledge or expertise to enable them to work in the metaverse in the future. Although 44% think the metaverse will improve their work productivity, three in five (59%) do not think or are not sure that their employers are currently investing enough in IT to help them maximize their productivity. Today, the term metaverse describes the future of the tech we will eventually hold, touch, use, and connect to — as well as the changes in human behavior that will follow.

運算領域的下一個巨浪——元宇宙已經發展得如火如荼。簡單而言，元宇宙是一個沉浸式的虛擬世界，所有用戶可以一起工作、遊戲及互動。這正是互聯網朝著 Web 3.0 方式演化的重要一步，並正獲得積極關注。由 Lenovo 進行的一項研究顯示，有近半（44%）的受訪員工願意在元宇宙中工作，並相信可以提升生產力。

目前，最常見的元宇宙願景是擁有真實世界、虛擬地方（如虛擬建築物），以及由創作者以分散式區塊鏈協定、非同質化代幣（NFT）及加密貨幣等技術創作的物件之實時 3D 立體地圖。元宇宙將會使虛擬世界中的所有信息恆久不變、可作分享，並可供多個用戶及在多重設備上存取，當中包括高像真度的增強實境及虛擬實境（AR/VR）設備及應用。

然而，這種元宇宙目前仍未存在。許多僱主仍未構想在元宇宙內的工作間。在 Lenovo 的調查中，有 43% 的受訪者認為僱主沒有可讓他們在元宇宙工作的知識或專業知識。雖然有 44% 受訪者認為元宇宙可以提升他們的生產力，同時卻有 59% 不相信或不確定他們的僱主現時是否在資訊科技有足夠的投資，以協助他們提升生產力。

The acceleration of technological evolution and adoption is partly why the metaverse is becoming important. In the past, enterprise AR/VR technology adoption was slower than comparable technologies because of the heterogeneous environment and lack of AR/VR companies that could offer an end-to-end solution, including services and support.

Until 2020, most global companies were evaluating commercial AR and VR use cases within their innovation teams. In 2020, COVID-19 became a catalyst for extended reality (XR) technologies (AR and VR technologies) to help enterprises maintain business continuity and enable people to collaborate and work remotely more efficiently. The interest in metaverse as a future state of technology where 3D data is easily created and universally readable grew, resulting in 3D applications that became the norm for business processes, productivity, and entertainment.

Take Lenovo's ThinkReality, for example. It provides a proven, scalable, and streamlined path from concept to production for enterprise XR applications. ThinkReality is conceived for today's world and the future. Business teams can connect existing XR devices and add advanced new devices as they become available. In addition, the platform allows customers to develop and deploy apps and content remotely throughout the enterprise while managing devices and applications from a single interface.

ThinkReality XR Services provides bespoke, end-to-end services to Lenovo customers, helping them quickly realize the return on their XR investments. It is currently the only complete solution that lets customers focus on problem-solving for their Metaverse real-estate by working across diverse hardware and software and providing the technology and insights needed in the new era of immersive computing.

Micron's Smarter Manufacturing With ThinkReality— A Case Study

Micron's journey with ThinkReality offers an excellent example of how it can help companies become agile with Metaverse-ready technologies.

In early 2019, Micron began exploring AR solutions for remote assistance to connect engineers on the shop floor with experts in a shared virtual environment. "Our plan was to use AR technology to enable technicians across different sites to work remotely together with subject matter experts in real time to carry out new equipment installations, machine troubleshooting, and maintenance," says Ning Khang Lee, director of Smart Manufacturing & AI, at Micron.

以往，企業因為欠缺可以提供涵蓋服務及支援端到端解決方案的 AR/VR 技術供應商，使 AR/VR 技術應用速度較同類技術為慢。在 2020 年，新冠疫情則成為涵蓋 AR/VR 的延展實境（extended reality，簡稱 XR）技術發展的催化劑，協助企業維持業務延續，同時讓員工提升工作及協作效率。

以 Lenovo ThinkReality 為例，這個設備為企業 XR 應用由概念到正式使用，提供了一個備受驗證、可延展及簡單的方法。ThinkReality XR 服務為 Lenovo 客戶提供了貼合需要的端到端服務，協助他們快速實現在 XR 的投資回報。它亦是現時唯一完整的方案，讓客戶可藉著設備與不同軟、硬件連動，提供在沉浸式運算新世代中所需要的技術及洞察能力。
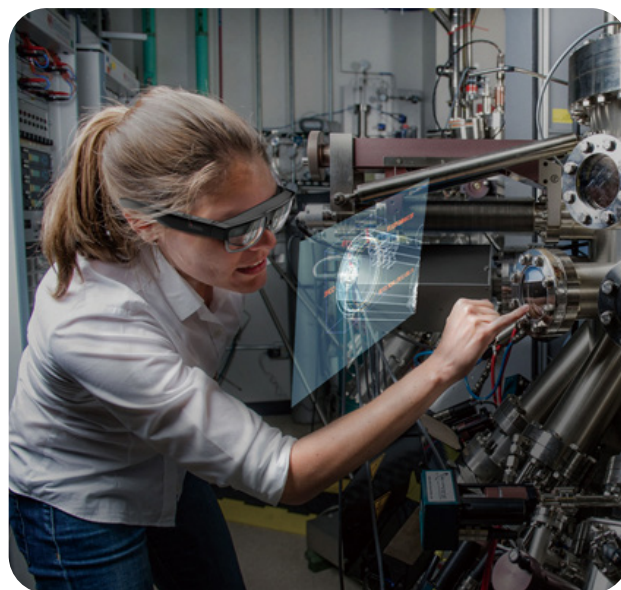
美光（Micron）運用 ThinkReality 智能製造個案

美光使用 ThinkReality 個案提供了一個卓越的例子，展示已為元宇宙作好準備的技術如何協助企業變得更加靈活。

早在 2019 年，美光已開始探索 AR 方案。美光智能製造及人工智能總監 Ning Khang Lee 表示：「我們計劃運用 AR 技術讓我們身處於不同生產基地的技術人員，與各種專業領域的專家實時遙距緊密合作，以進行維護等工作。」

"Lenovo was an easy choice for the underlying platform. The Lenovo ThinkReality platform is specifically optimized for the holo|one suite of mixed reality software applications, enabling us to take advantage of the agility and flexibility of a disruptive startup like holo|one with the guarantees and excellent services from a tech giant like Lenovo."

When news of the COVID-19 outbreak began circulating in 2020, Micron quickly accelerated the program roadmap and launched a proof-of-concept exercise. Micron worked closely with Lenovo to integrate ThinkReality with its internal systems and meet stringent security requirements. According to Lee, "To protect our intellectual property, we need to ensure that data streaming between on-site engineers and external experts is completely secure. Both the Lenovo and holo|one teams put in a lot of development hours to help us achieve the right balance of openness, ease of use, and security."

Impressed with the results of the project's first phase, Micron is now finalizing phase two of its AR program — to enable AR standard operating procedures (SOPs) at the point of demand. The company is working with Lenovo, relying on its XR Services offering to convert SOPs into AR format so that engineers will have step-by-step guidance in their peripheral visions with the wearables on.

Lee elaborates, "Our goal is to integrate AR workflows with Blueprint, our custom-developed mobile app. If a machine goes down, engineers get an alert via Blueprint, instructions for repair, and a checklist for returning it to an operational state. By making these SOPs available via the ThinkReality platform and holo|one, engineers can work more efficiently and productively to get machines up and running again. We're working closely with Lenovo's XR Service team to integrate Blueprint with the ThinkReality platform via custom APIs."

Phase three of the project will expand on the SOP solution, including 3D overlays and deviation detection via machine vision. "Particularly for complex repairs and SOPs with higher possibilities for human error, 3D overlays will act as an extra helping hand, and the visual AI will alert engineers if any mismatch is detected," says Chong Ee Low, manager of Smart Manufacturing & AI at Micron. "This will also help when training newly qualified engineers. Phase three is still at an early stage, but we are very excited about the ongoing evolution of our remote assistance solutions."

"We believe that AR/VR technology has a vital role to play in the future of manufacturing," Lee concludes. "With the Lenovo ThinkReality solution powered by holo|one software, engineers can work more efficiently to keep production facilities running smoothly, helping us to meet the growing demand for our products."

To learn more about how Micron is using AR technology to build smarter manufacturing capabilities and help companies take a step closer to the metaverse, read this case study (https://lenovosuccess.com/casestudy/successfully-using-ar-and-automation-to-create-efficiencies-micron-technology). 🔗

他補充:「我們決定使用 Lenovo 這個平台。因為 Lenovo ThinkReality 為了 holo|one 混合實境(mixed reality)軟件應用作專門優化,讓我們可以充分運用如 holo|one 等初創企業的靈活性優勢,同時又可享用到來自 Lenovo 等科技巨企的優質卓越服務。」

當新冠疫情在 2020 年爆發時,美光更加速項目部署,與 Lenovo 緊密合作,把 ThinkReality 整合到內部系統,同時滿足了嚴謹的保安要求。Ning Khang Lee 指:「為了保障我們的知識產權,我們必須確保前線工程人員及外部專家的數據連接是完全保密及安全。Lenovo 及 holo|one 團隊在平行系統開放、容易使用及保安方面投放了大量資源。」

第二階段項目則應用在有需要時啟動的 AR 標準操作流程(Standard Operating Procedure,簡稱 SOP)。Ning Khang Lee 解釋道:「我們的目標是把 AR 工作流程整合到我們專門研發的流動應用 Blueprint 之上,假如機器出現事故,工程師可以收到 Blueprint 的警示,並獲得維修指引。此後,工程師工作效率及生產力會有所提升,使機器更快重新投入運作。」

第三階段項目將會擴展 SOP 方案,當中包括 3D 圖像疊加及透過機器視野偵測偏差情況。美光智能製造及人工智能經理 Chong Ee Low 表示:「3D 圖像疊加將可以幫助很大機會出現人為錯誤的複雜維修工序及 SOP,而視像化的人工智能更會在偵測出異常時通知工程師,並協助我們培訓新獲資格的工程師。」

Ning Khang Lee 總結:「我們相信,AR/VR 技術將會在未來製造業扮演關鍵角色。藉著 Lenovo ThinkReality 方案配合 holo|one 軟件,工程師可以提升工作效率,同時確保生產設施運行暢順,協助我們迎合市場對我們產品持續增長的需求。」

如欲了解更多美光如何運用 AR 技術建造更具智能的製造能力,並協助企業如何步進元宇宙時代,可瀏覽這個個案分享(https://lenovosuccess.com/casestudy/successfully-using-ar-and-automation-to-create-efficiencies-micron-technology)。🔗