HKT, the Emerging Frontier in Metaverse Development in Hong Kong
香港電訊──香港元宇宙發展的先行者

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A number of industry leaders in Hong Kong including Hong Kong Telecom (HKT) have joined hands to create a new cultural hub, Mega City, based on and inspired by a variety of local talents and major gaming figures. Mega City is a patchwork of diverse skills and success stories found in Hong Kong's technical innovation and colourful culture. This is the very first partnership founded locally, putting the idea of integrated communication, media and technology (CMT)-based metaverse into action on the ground.

Ms. Susanna Hui, Group Managing Director of HKT, believes that the metaverse is the future of the Internet, which has been undergoing rapid growth since its start. It has evolved from Web 1.0, the content delivery network in the early nineties, through Web 2.0, a participative social web that emphasises user interaction, to Web 3.0, from which the metaverse concept emerged, marrying data-driven semantic solutions with machine learning. As the most representative form of Web 3.0 so far, metaverse presents the idea of an embodied Internet or immersive virtual world accessible by virtual reality (VR) and augmented reality (AR) technology. Digital users can create and own digital assets, socialise and engage in all sorts of virtual activities in this realm. HKT is the first company in Hong Kong to offer a virtual 5G mobile service in the metaverse. The Company's long-term vision is to develop a viable business model tailored for the metaverse, by bridging the physical world to the virtual one so as to enable a larger customer base to participate in it.

香港電訊聯同若干業界領導者攜手合作，為香港打造嶄新的文化網絡中心 Mega City。Mega City 的設計以一系列本地人才及主要遊戲人物為藍圖，並由多個有關各項技術及香港科技創新的成功故事所組成。Mega City 將是全港首個在元宇宙世界觀中融合通訊、媒體及科技的大型業界合作。

香港電訊集團董事總經理許漢卿女士相信元宇宙正步入高速發展期，為未來網絡發展的基石。網絡 1.0 時代在九十年代初崛起，大多側重於內容的傳遞；隨後的網絡 2.0 時代提倡更多的是網絡與用戶間的互動；時至網絡 3.0 時代，元宇宙概念初露鋒芒，結合數據和機器學習帶領新熱潮。擴增實境（AR）及虛擬實境（VR）作為網絡 3.0 時代中最具代表性的技術，為元宇宙的沉浸式體驗提供穩固的基礎，如創造及擁有數碼財產、支援參與社交及各種的虛擬活動等。作為全港首間在元宇宙推出虛擬 5G 流動網絡的公司，香港電訊冀能透過加強現實和虛擬世界的連結，推出圍繞元宇宙概念的營運模式，確保具備可持續發展性的同時滿足擴大元宇宙的顧客群的願景。

Hui suggests that the Hong Kong government should make an effort to boost user interaction and raise international recognition to make sure that the metaverse is not merely a short-lived trend that will ultimately lose its hype. In addition to enhancing the technical aspects for users to participate in Mega City, both the commercial and the public sectors should actively optimise marketing, branding, and 360-degree customer service efforts to enhance brand loyalty and make Mega City an indispensable part of our everyday life.

How is HKT Building Mega City, One of the Very First Metaverse Virtual Worlds in Hong Kong?

Hui envisions the metaverse through a four-layer paradigm, consisting of **content**, **platform**, **infrastructure**, and **enabler**.

The top level of the framework is **content**. With boundless content available, the Internet has now become an exclusive access point to all happenings in the world. Content simply refers to anything available to the digital audience in the virtual arena, including games, television, e-commerce, social media and so forth. The spawning needs for the creator economy and rise of content driven platforms such as TikTok also herald a new era in content creation, representing a tremendous driving force behind the development of the metaverse.

Platform signifies the ecosystem that supports the metaverse, which comes after content. This includes strategic alliances or investments by top tech companies such as Meta and Microsoft that are advantageous to the expansion of metaverse platforms.

As for **infrastructure**, it refers to the innovation and technologies such as the 5G network, AR/VR etc. that have built a foundation for metaverse. One of the most challenging aspects here is connectivity, since insufficient capacity and poor latency in software and hardware solutions and the underlying network are impediments that will hinder stable performance and prevent the metaverse from being a fun experience.

At the bottom of the framework is the essential **enabler** layer. It enables the establishment of unique IDs, eases the processing of payments, provides assurance so that users' identities can be confirmed when conducting transactions in the virtual world, and bridges the brick-and-mortar world with the virtual one.

Possessing all four aspects of the framework, HKT has a unique advantage over other players when it comes to the metaverse space. Thanks to HKT's extensive customer base, a single ID solution can now be adopted, which considerably simplifies the user experience in accessing the metaverse. It allows user data to readily move around the metaverse and between the physical and virtual worlds. In such a way, the extensive customer base of HKT may very well be more motivated to try and participate in the metaverse. In addition, with a world-class 5G network in place, HKT is well positioned and well equipped to cater for the explosive growth of the metaverse and the new potential for VR / AR.

許女士建議香港政府應投放更多資源促進元宇宙用戶間的互動以提高國際認受性，避免元宇宙熱潮的失效。為了方便使用者參與到 Mega City 當中，除了改善元宇宙技術外，業界及公共部門應在優化市場營銷、品牌推廣及全方位顧客服務時展現積極的態度，以提升品牌忠誠度，使 Mega City 成為大眾日常生活不可或缺的一部分。

香港電訊如何建立全港第一個元宇宙虛擬世界 Mega City？

許女士認為元宇宙的發展可細分為四個層面，當中包括「內容」、「平台」、「基礎設施」及「推動者」。

網絡世界有無窮無盡的資訊，用戶連結到網絡世界時先會接觸到「內容」層面。「內容」即涵蓋網絡世界中向用戶顯示的所有資訊，當中包括在電子遊戲、電視、電子商務、社交媒體的內容等。創作者經濟的急速發展及 Tik Tok 等內容導向平台興起，都預示了內容創作踏入新紀元，成為推動元宇宙發展不可多得的要素。

頂尖科技公司如 Meta 及 Microsoft 的投資及相互合作則有利於元宇宙平台擴張，建構多元化的「平台」，支撐元宇宙中的生態圈。

元宇宙需要不同的創科技術鞏固其發展，如 5G 網絡、AR、VR 等，以構成元宇宙發展的「基礎設施」。目前元宇宙仍有許多挑戰必須克服，當中最具挑戰性的是連接性，包括軟硬件與網絡三者之間的連接能力、容量不足及延遲等問題。這些不足會減低運行元宇宙時的系統穩定性，阻礙用戶體驗時的流暢度。

最後是關鍵的「推動者」層面，「推動者」鼓勵用戶在元宇宙中建立其專屬 IDs、簡化付款程序、並負責認證在虛擬世界付款的用家身份，作為現實世界和虛擬世界的橋樑。

香港電訊在四個層面都具備優秀的條件，在市場上保持領先優勢。香港電訊擁有龐大的客戶群，透過簡化及整合資料，能讓用戶在使用元宇宙時省卻繁瑣程序。香港電訊的數據可輕鬆在元宇宙及現實間傳輸，讓用戶無憂地穿梭於元宇宙之中。此外，香港電訊憑藉其世界級的 5G 網絡，充分滿足未來對元宇宙、VR 設備、AR 設備等需求，致力實現元宇宙之願景。
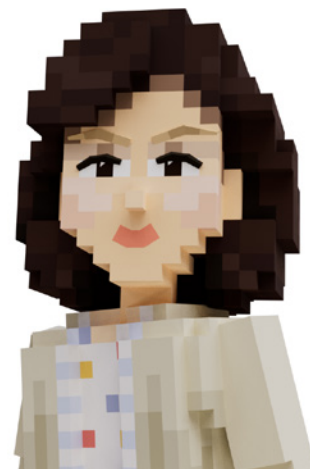
Rise to the Challenges

In spite of this, Hui believes that there is still a long way to go to establishing a sustainable universe in virtual reality. The first big challenge is usability: how can one enable more users to access the metaverse? This is something developers and stakeholders need to address. Currently, not many people own fancy devices that meet the technical requirements for metaverse access. Increasing the number of devices available for greater accessibility is definitely helpful. However, while VR headsets and AR glasses create immersive experiences, they can also be cumbersome and uncomfortable for daily use. Hence, Hui expects, sooner or later, mobile solution for the metaverse will be developed in a bid to reach a broader audience who only has access to mobile device. With this in mind, HKT plans to put a futuristic twist on traditional movies, music, and television shows, as a new way of consuming entertainment content in the metaverse.

The second challenge is to ensure a comprehensive user base within the metaverse. At the forefront of the Internet evolution from 2D digital platforms to 3D virtual environments are popular live streaming and gaming networks of digital natives such as TikTok and Roblox. While the virtual world currently revolves around gaming targeting Generation Z, the younger generation should not be the only ones taking part in the metaverse. Hui emphasises the significance of including the elder generations: It will expand metaverse participation for sustainable development. Instead of gaming, the elder generation are more attracted to activities such as movies, exercise, or even public services, to name a few. In the past couple of years, customer acceptance of the virtual world has grown significantly as a result of COVID-19 lockdowns. The society as a whole has become more and more receptive to the use of digital technology. For instance, the Nintendo Switch's ring fit app is now a big hit, since its gaming features not only appeal to users of all ages but also promote health and wellness in the community. Down the road, elderly-focused coordination exercises might also be the next trend, as people discover new ways to let seniors benefit from these connected platforms. Many of the elderly are now using social media, video games, and YouTube videos to interact online with their digital native grandchildren. Others install in-home tech equipment and employ wearable tech to help with daily tasks. Ultimately, a larger user base will lead to more money and investment, which will, in turn, enrich the metaverse.

The third challenge is related to cryptocurrencies: How can virtual worlds be monetised in the long run? Market volatility is inevitable in the real and virtual worlds, and fluctuations should always be noted. Traded in cryptocurrencies, non-fungible tokens (NFTs) could serve as certificates of ownership to power the monetisation of metaverse assets, including content and digital product creation. While opportunities abound in the space of NFTs and the metaverse marketplace, concerns over manipulation, fraud and money laundering in digital commerce are well-founded. Conventional compliance regulations typically require users to provide personal information, which contradicts the decentralised

挑戰冒起

為迎接有關元宇宙的商機，香港電訊已做好充足的準備，惟許女士認為現時與在虛擬世界建立一個可持續的社區仍有一段距離。第一個挑戰是可用性，要考慮如何能讓更多用戶參與至虛擬世界，這將是開發人員及持份者需要共同解決的問題。目前，擁有符合元宇宙技術要求的裝置的用戶仍為數不多，因此提升裝置的數量將能提高元宇宙的普及程度。VR 頭盔及 AR 眼鏡雖能提供身臨其境的體驗，但對於日常使用來說未夠輕便。因此，許女士預計針對元宇宙的流動應用解決方案或遲或早將會出現，藉此觸及只有流動裝置的客戶群。考慮到這個發展趨勢，香港電訊計劃把傳統電影、音樂和電視節目等娛樂內容轉化，使其成為元宇宙上嶄新的消費娛樂模式。

第二個挑戰則是確保元宇宙用戶的多元性。人氣直播及遊戲網絡平台如 TikTok 和 Roblox 見證著網絡內容從 2D 到 3D 的轉變。現時，虛擬世界大多圍繞 Z 世代用戶及遊戲產業，然而年輕一代不應是唯一參與元宇宙的族群。許女士強調元宇宙應包含其他年齡層，從而增加互動選項，促進元宇宙的可持續性發展。與遊戲相比，年長一代更能受到電影、運動、甚至公共服務相關的內容所吸引。過去幾年因新冠肺炎造成的社區隔離措施使市民對虛擬世界的接受程度大增，整體上更容易接受電子科技融合到日常生活中。舉例來說，任天堂的健身環大冒險大受歡迎的原因是它的特點既能吸引各個年齡層的玩家，亦可在社區推廣健康生活的信息。當業界不斷嘗試發掘新方式讓長者參與到網絡世界時，針對長者而設的協調練習和遊戲或可成為下一個趨勢。許多長者已學會使用社交媒體、電子遊戲和 YouTube 短片來與他們的孫輩交流，或已在家中安裝智能家居裝置穿戴科技產品以協助日常生活。顯然地，龐大的用戶數量會引來多方投資，對元宇宙的發展大有助益。

and anonymous nature of cryptocurrencies. However, certain rules must still be implemented to ensure transparency and assure market stability so that institutional investments are willing to participate in scale in the metaverse. For regulated cryptocurrency, the more capital invested, the stabler the price, promoting the metaverse's value and stability.

One last challenge in the forefront is that businesses are struggling with the shortage of tech talent. This is no secret: according to research, over 50% of CEOs have voiced concerns throughout the last decade over digital technology skills shortage. To remedy this, HKT actively seeks collaboration with other multinationals and start-ups, even tapping into the tech workforce from around the world. This could be a situation with mutual benefits, which not only opens up new perspectives for HKT, but also helps startups gain greater presence in the market.

Nowadays, the digital world is increasingly dominating the life of people in the physical world. However, Hui strives to pursue a balance between the two realms. She sees metaverse not as a replacement for reality, but rather an addition to it. The digital world can provide enhanced experiences in physical reality by providing us with brand new ways to communicate and access information. To maintain this balance, it's important to know when to advance and when to retreat. Users, especially young ones, could lose their way in immersive experiences. Parents must do their part in navigating this new digital world alongside their children. It could also be beneficial invest in education, so that the younger generation can distinguish between what is real and what is virtual. Some believe that, without proper regulating measures, the metaverse could be a new breeding ground for cyberbullying, child abuse, illegal acts and misinformation. That is why universal standards and rules for all metaverse users should be established and enforced. There is a long road ahead, but it is never too late for businesses, industry partners, developers, civil right groups and academic institutions to collaborate and decide on how to responsibly build these technologies and platforms. ✎

如何能透過虛擬貨幣在元宇宙中長期賺取利潤是第三個備受關注的議題。無論在真實世界或虛擬世界，市場的波動性都是無可避免的，投資者應隨時留意市場浮動。以虛擬貨幣進行交易的非同質化代幣（NFT）可以作為創作者擁有虛擬資產的證明，當中內容創作及電子創作，驅動元宇宙利潤化。雖然 NFT 及元宇宙概念蘊含大量機遇，但經濟操控、詐騙及洗黑錢等的不法行為在元宇宙世界依然隨處可見。傳統的法規要求用戶提供個人資料，然而此做法與元宇宙提倡的虛擬貨幣去中心化及匿名的性質相互矛盾。儘管如此，相關監管機制仍有需要被落實，以確保市場的透明度及穩定性，繼而吸引投資者對元宇宙進行大規模的投資。越多資金被投放於受監管的虛擬貨幣，虛擬貨幣的價格穩定性就越高，元宇宙的價值和穩定性就會越高。

最後一個挑戰是科技人才的短缺。調查指出，超過一半的行政總裁在過去十年都曾提出數碼科技人才不足的顧慮。為了解決此問題，香港電訊積極尋求與跨國企業及初創企業的合作機遇，促進世界各地的人才交流，不但為香港電訊和業界開闢了新的視野，亦有助於初創企業提高其知名度，從而達致雙贏局面。

雖然虛擬世界正漸漸支配人們的現實生活，許女士卻認為需要在兩個領域之間取得平衡。她認為元宇宙非但不會取締現實世界，更會輔助現實世界的發展。數碼世界為社會提供了嶄新的溝通方式及資訊來源，提升現實世界的各種體驗，但亦需要適當地控制發展前進的方向與步伐以維持平衡。用戶或會迷失在沉浸式的虛擬世界中，尤其是較為年輕的用家，因此家長在兒童使用網絡設備時必須提供合適的指導。社會各界也可投資更多於科技媒體素養教育上，從少教導兒童拿捏真實與虛擬國度的邊界。社會上有聲音認為若沒有針對元宇宙而立的規管措施，元宇宙或會成為另一個培養網絡欺凌、虐待兒童、非法行為和假資訊氾濫的平台，因此所有元宇宙用家需要受到統一的操守標準和管理機制監管。虛擬世界的未來發展備受關注，商界、行業夥伴、開發人員、公民權益組織及學術機構應攜手合作，共同決定元宇宙的規管及發展方向。✎