How can virtual and augmented reality facilitate international business?

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Abstract

While extensive research has explored the Internet's role in internationalization, there's limited understanding of how augmented reality (AR) and virtual reality (VR) contribute. Our objective is to address and fill this gap by investigating the roles of AR and VR in international expansion of services and cultural products. The paper addresses facilitators and barriers for the use of these technologies in international business. It argues that advancements in information and communication technologies have played a pivotal role in fostering the integration of AR and VR into global business operations. The study examines the role of these technologies in inward internationalization, particularly in the tourism sector The article also delves into the disintermediation effects of AR and VR compared to internet-based platforms, emphasizing their potential to outperform traditional e-commerce websites. Additionally, the research explores how AR and VR stimulate the internationalization of cultural products, such as concerts and visual art, overcoming geographical constraints. AR and VR technologies are currently in use by a variety of entities, including national tourism authorities, destination management organizations (DMOs), and service providers in the travel and hospitality industries, such as airlines and hotels. They are also employed by producers of cultural products, such as concerts and visual art. The ongoing advancements in these technologies are expected to broaden their existing applications.

Keywords: augmented reality, blockchain, generative artificial intelligence, tourism, virtual reality

1. Introduction

Prior research has shown that information and communication technologies (ICTs) stimulate international trade and investment (Kshetri, 2019; Leek et al., 2003). Especially, businesses have found the internet to be instrumental in overcoming a range of barriers to international expansion. For example, during the 2000s, e-commerce companies in the Caribbean (Fraser & Wresch, 2005) and Nepal (Kshetri, 2007) effectively utilized the Internet to internationalize, primarily targeting expatriate market segments. Similarly, e-commerce enterprises in Tanzania (Pigato, 2000) and Vietnam (Bui et al., 2006) leveraged the Internet to attract foreign tourists to their countries.

However, some scholars have raised doubts about the efficacy of exclusively depending on the internet for internationalization (Sinkovics et al., 2013). They contend that replacing a physical market presence with internet-based approaches may not lead to improved export performance, asserting that companies adopting such strategies are vulnerable to what is termed the "virtuality trap" (Sinkovics et al., 2013). Note that the term 'virtuality trap' refers to the internationalizing firm's perception that the knowledge gained from virtual interactions eliminates the necessity to learn about target markets through non-virtual methods (Yamin & Sinkovics, 2006).

In recent years, establishing operations in the metaverse and using VR and AR have become a pathway to reach the global audience. To take an example, in May 2023, the Tourism Authority of Thailand (TAT) officially entered into a memorandum of understanding with Bitkub Blockchain Technology Co to collaborate on the promotion of Thai tourism within the Bitkub Metaverse. This partnership involves the creation of a tourism-themed exhibition. Bitkub Metaverse expects to facilitate the use of virtual reality in tourism promotion (Tourism Authority of Thailand, 2023). This strategic move aims to appeal to millennials and international tourists. Bitkub anticipates reaching 300,000 metaverse users in the initial phase, with approximately 100,000 users transitioning into physical tourists (Bangkok Post. 2023). ABX Company Limited, whose line of business includes operating public hotels and motels (https://www.bloomberg.com/profile/company/1289023D:TB), is set to experience substantial advantages with the integration of AR and VR technology. In a strategic move, ABX has formed a partnership with Bitkub Metaverse to introduce the first virtual reality hotel. This emphasizes the growing importance of technology within the virtual world (Nation, 2023).

Immersive technologies such as augmented reality (AR), and virtual reality (VR) also have the potential to increase the export of cultural products and entertainment such as live concerts and events. For instance, on the Indian Republic Day January 26, 2022, the first Metaverse Concert by Indian bhangra/pop singer Daler Mehndi attracted 20 million viewers from all over the world (Outlook India, 2022).

It is evident from the previous discussion that, much like in other domains (e.g., Dwivedi et al., 2022; Koohang et al., 2023; Mogaji et al., 2023a) such as banking and finance (Ooi et al., 2023), fashion (e.g., Mogaji et al., 2023), transportation (Mogaji, 2023) and tourism (Buhalis et al., 2023), immersive technologies like augmented reality (AR) and virtual reality (VR) are emerging as significant forces in the realm of international business. While a substantial body of research has explored the roles of the Internet in facilitating internationalization activities (e.g., Bui et al., 2006; abrielsson & Gabrielsson, 2011; Morgan-Thom & Bridgewater, 2004; Sinkovics et al., 2013; Tajpour & Razavi, 2023; Tajpour et al., 2023; Yamin & Sinkovics, 2006), there has been limited research examining how AR and VR contribute to the process of internationalization. This represents a notable research gap, especially considering the significance of AR and VR as key Fourth Industrial Revolution (4IR) technologies (Kshetri, 2023b). Our objective is to address and fill this research gap. Our focus is thus on investigating the roles of AR and VR in facilitating the international expansion of services and cultural products. The research question addressed is: What impact do VR and AR have on the international expansion of services and cultural products? The argument presented in this paper suggests that when firms incorporate immersive technologies such as AR and VR in their internationalization efforts, they are less prone to succumbing to the "virtuality trap".

The remainder of the paper is structured as follows. In the following section, we examine the key facilitators and barriers for the use of immersive technologies in international business. This section analyses factors such as technological advancements, local solutions, integration of generative artificial intelligence (GAI), and governmental support. The subsequent section develops some research propositions. Next, the discussion and implications section examines the research findings and delineates their implications for researchers, international business managers, and policymakers. Finally, the conclusion section summarizes key findings of the paper.

2. Facilitators and barriers for the use of immersive technologies in international business

Just like in many other areas (e.g., Dwivedi et al., 2022; Koohang et al., 2023; Mogaji et al., 2023a) such as banking and finance (Ooi et al., 2023), fashion (e.g., Mogaji et al., 2023) and transport (Mogaji, 2023), several factors have facilitated the growth of the use of immersive technologies such as AR and VR in international business (Table 1). First, advancements in information and communication technologies (ICTs), especially in VR and AR, have stimulated the use of immersive technologies in international business. Certain technological limitations of immersive technologies have already been resolved. For instance, the graphics processing unit (GPU) in Meta Quest 3, which was released in October 2023, is more than twice as fast as that of Meta Quest 2, ushering in new possibilities for developers and marking a significant advancement (Bezmalinovic, 2023). The costs of VR and AR devices have also lowered. In March 2023, Meta reduced prices for two VR headsets to encourage adoption of the technology. The Meta Quest Pro headset's price was cut by $500, down to $999, six months after its release. The Quest 2 headset was priced at $429.99, reduced from $499.99 (Thorbecke, 2023). Likewise, in September 2023, High-end VR headset manufacturer Varjo reduced the price of its Varjo

Aero VR headset by 50%, bringing it down to $990 from the original price of nearly $2,000 (Erl, 2023).

Second, especially in the context of emerging economies, the presence of domestically created solutions has eased the integration of immersive technologies into international business activities. For instance, Daler Mehndi concert mentioned above was performed on the PartyNite platform created by Hyderabad, India-based company Gamitronics, which focuses on augmented reality (AR) and VR (Outlook India, 2022).

Table 1: Overview of facilitators and barriers in the use of immersive technologies in internationalization

Facilitators	
Advancements in ICTs	Improvements in ICTs, particularly in VR and AR, have played a pivotal role in fostering the incorporation of immersive technologies into international business operations.
Availability of locally developed solutions	Particularly in emerging economies, locally developed solutions have facilitated the integration of immersive technologies into international business operations.
Incorporation of GAI with immersive technologies	With the progression of generative artificial intelligence (GAI) technologies, there is an anticipation that companies will shift their focus towards the creation of increasingly sophisticated immersive solutions.
Government support	Government agencies in some countries are actively promoting the utilization of immersive technologies to boost international trade and investment.
Barriers	
High costs	Despite a rapid reduction in the costs of VR ad AR devices, The affordability of essential immersive hardware remains a concern, especially in low-income countries.
Requirement of advanced technological infrastructures	The absence of advanced technological infrastructures in the developing world poses a challenge to exporting some services using VR and AR.
Time-intensive and significant costs	Creating VR and AR applications is a time-intensive endeavor that incurs substantial costs.

Third, generative artificial intelligence (GAI) has the potential to aid in the advancement of the immersive technologies. For instance, through the integration of tools from Metaverse creator Ilumine AI and image generator Midjourney, the creation of a virtual space is expedited (ecommercenews.eu 2023). While these experiments currently are primarily occurring within the gaming realm, the transition to an online shopping or e-government setting is entirely feasible in the near future (ecommercenews.eu, 2023). Thus, as GAI technologies advance, companies are expected to reorient their attention toward the development of more advanced immersive solutions.

Fourth, in some countries, government agencies are supporting the use of immersive technologies to promote international trade and investment. For instance, Governor Lee Cheol-woo of South Korea's Gyeongbuk province has unveiled plans to leverage the Metaverse, utilizing 3D virtual worlds accessed through VR headsets, to boost commercial activities between South Korea and Vietnam (Park, 2022).

. The Metaverse is also expected to facilitate cultural, trade, and people-to-people exchanges between the two nations. A goal is to create a sustainable Metaverse industrial ecosystem consisting of a special Metaverse zone with specific regulations within the special zone. The project is arguably the first state-backed Metaverse project to be used outside South Korea (Pessarlay, 2022). The use of the Metaverse by government agencies to facilitate international trade and investment thus needs to be explored in future research.

A number of barriers hinder the use of the immersive technologies by firms in the developing world (Table 1). An important barrier centers on the costs of devices to access Metaverse-based services. While the costs of such devices are reducing rapidly, there are still concerns about the affordability of required immersive hardware, especially in low-income countries.

Second, exports of some services using VR and AR require advanced technological infrastructures, which are lacking in the developing world. For instance, real-time healthcare applications such as remote surgery via immersive technologies require ultra-wide bandwidth technologies such as 5G cellular networks, which provide a low latency, high capacity and speed. In 2026, 5G subscribers are projected to dominate in North America, constituting 84% of the user base, while Sub-Saharan Africa (SSA) is expected to account for a more modest 7% (Kshetri, 2023b).

Third, the process of developing VR and AR applications is time-intensive and comes with significant costs. For instance, the development of a basic VR application typically demands a timeframe of 6-8 weeks and a minimum financial commitment of $15,000. In contrast, a project with moderate complexity, such as incorporating VR functionality into an online store, might extend over 4-6 months and incur a starting cost of $30,000 (Pavlov, 2023). Most firms, especially small and medium-sized enterprises (SMEs) find these costs to be prohibitive.

3. Some research propositions

As noted above, the research question addressed in this paper is: What impact do immersive technologies such as VR and AR have on the international expansion of services and cultural products? These research questions have been addressed by examining the effects of these technologies on inward internationalization of services, especially tourism and the internationalization of cultural products and artifacts.

The four propositions in this section collectively address the impact of VR and AR on internationalization. Proposition 1 emphasizes the overall effectiveness of VR and AR in inward internationalization compared to non-immersive Internet platforms. Proposition 2 discusses a stronger disintermediation effect of VR and AR in tourism than the Internet. Propositions 3 and 4 respectively focus on the stimulation of internationalization in cultural products like concerts and creative tangible products such as art through VR and AR.

3.1 Immersive technologies and inward internationalization

While research on the internationalization of service firms has predominantly delved into the evolution of their outward expansion strategies, within specific sectors, such as tourism, a distinct approach known as "inward internationalization" has surfaced. In this approach, service

firms market their services abroad, often leveraging intermediaries like tour operators and travel agents. Their expectation is that customers will travel to their home country to experience the locally produced services (Bianchi, 2011; Björkman & Kock, 1997). In a different mode of internationalization, for products that can be digitized such as music, small companies can internationalize by engaging in collaborations with platform operations (e,g., Spotify) (Etemad, 2022) .

Prior researchers have noted that immersive technologies such as VR and AR can be used as a tool to enhance the physical world (Boutenko et al., 2022; Kesim & Ozarslan, 2012). Of special relevance is the role of the metaverse in national marketing strategies in international tourism (Frost, 2019).

Visiting a country is likely to be more realistic supplemented by using the metaverse. In this way, the metaverse can complement traditional travel. Businesses in the travel and tourism industry such as hotel chains, cruise brands, and travel agencies can use the metaverse to promote and showcase their products. Travellers can visit the metaverses of two different cities and compare key attractions and hotels using 3D images that have accurate colors, lights, dimensions, sounds and other features (Travel Daily News, 2022). For instance, Egypt's General Authority for Health Care is using the metaverse to promote its medical tourism project. Tourists can visit the metaverses of the health facilities affiliated with the authority such as those in Port Said, Luxor and Ismailia to understand whether these facilities' capabilities match their needs. Potential health tourists can also get ideas about other facilities such as hotel amenities in the cities (Hanafi, 2022).

Likewise, South Korea city, Incheon has created Incheon Craft, which is a virtual city of Incheon that uses Mojang Studios' sandbox game Minecraft. This metaverse entertainment

content provides ‘Incheon experience’. In Minecraft, players explore a virtual world as avatars. This feature allows users to create and experience Incheon in the metaverse world. In this way, Incheon delivers the Metaverse experience to tourists without physically being in the city. Incheon’s ‘virtual world’ provides experience is not possible in the real world. Users can create their avatars and interact with other players’ avatars. Incheon Craft makes it possible to experience historical events, interact with historical figures, and learn historical facts in Incheon Metaverse (Um et al., 2022). Another immersive app used by the city is Incheon AR. Unlike virtual reality metaverse Incheon Craft, Incheon AR provides one-way interactive content. Tourists can use their smartphone camera and AR application to experience AR in the real world, which is expected to increase tourism attractiveness (Um et al., 2022).

As noted, for digitizable products like music, small companies can globally expand by collaborating with platforms (Etemad, 2022). For some products VR and AR platforms are likely to be more effective than non-immersive platforms such as Spotify. It is thus proposed that:

Proposition 1: VR and AR are more effective in facilitating inward internationalization compared to a non-immersive Internet-based platforms.

3.2 Disintermediation effect of immersive technologies

Previous studies have observed that the internet serves as a valuable instrument for mitigating export barriers and effectively reaching international customers (Sinkovics et al., 2013). Traditional export marketing channels like agents and distributors were confronted with the prospect of disintermediation due to the internet (Sinkovics et al., 2013). In the tourism sector, for instance, some analysts were concerned that the livelihood of travel agents would be jeopardized by the trend of disintermediation caused by the internet (Tse, 2003).

However, beyond superficial assessments, the implications of internet-led disintermediation unfold in ways that are more intricate and substantial. It is important to carefully assess the diverse and crucial functions intermediaries perform before making a decision to eliminate them (Jallat & Capek, 2001). Prior researchers have noted that some companies that are overly dependent on internet strategies are susceptible to succumb to what can be termed the "virtuality trap" (Sinkovics et al., 2013).

To comprehend the effects of the Internet and e-commerce on intermediaries, an analysis is required to delve into the reshaping and reconstruction of the roles and functions of conventional economic entities (Jallat & Capek, 2001). In the tourism industry, prior research has suggested that some tourists frequently refer to a variety of information sources, including input from family and friends, online reviews, and travel agencies (Del Chiappa & Balboni, 2019). This means that e-commerce websites cannot completely replace the functions performed by travel agencies.

We argue that immersive technologies such as AR and VR are likely to exhibit superior disintermediation effects in contrast to traditional e-commerce websites. For instance, the likelihood is high that Incheon Craft and Incheon AR will provide information that is more detailed, richer, and impactful when compared to the Incheon city website. Likewise, as noted above, utilizing immersive technologies, Egypt's General Authority for Health Care enables potential tourists to acquire in-depth information about affiliated health facilities and various amenities, including hotels (Hanafi, 2022). Tourists utilizing these immersive tools are thus less likely to visit travel agencies for information compared to those just visiting the websites of these organisations. In sum, we argue that:

Proposition 2: The disintermediation effect of VR and ARin the tourism industry is likely to be stronger than that of the Internet.

3.3 Internationalization of cultural products and artifacts

The Internet facilitated the internationalization of an array of goods and services that can be transmitted through the Internet, without the need for physical transportation. Numerous services, such as business consulting and higher education, possess significant potential for global expansion (Petersen et al., 2002). Nevertheless, the Internet proves to be of limited assistance in facilitating the internationalization of cultural products. Note that cultural products encompass both tangible and intangible creations originating from a specific culture, serving as reflections of its perspectives (National Standards for Foreign Language Education Project, 1999). Tangible products include paintings or s piece of art. Intangible products include dances and concerts. Such products rely on geographically fixed service providers. A key point from our perspective is that low-income economies in regions such as sub-Saharan Africa, the Caribbean, and the Arab States continue to have a limited influence in international flows of cultural goods and services (The UNESCO Institute for Statistics (UIS), 2016)

For geographically fixed service providers, the service originates in a set location, often the provider's home country, requiring consumers to visit that specific location for purchases. This is exemplified by events like Reggae Sunsplash in Jamaica, Carnival in Trinidad, Cropover in Barbados, and Jazz in St. Lucia (Bourne, & Allgrove, 1997). For such products, challenges also arise due to constraints such as limited local infrastructure, transportation, and associated travel expenses, hindering foreign demand (Bourne, & Allgrove, 1997).

Some of these limitations can be surmounted through the application of advanced electronic technology. Video technology, in particular, enables the seamless transmission of live performances from one location to various distant places at a reasonable cost for consumers in

those areas. The economies of scale resulting from a much larger global audience render the utilization of such technology economically viable (Bourne, & Allgrove, 1997).

Immersive technologies prove significantly more effective than basic video technologies. These technologies can leverage the human senses to *give* a near real-world-like experience to viewers. For entertainment events such as concerts, immersive technologies allows viewers to participate virtually and get almost real experience (Khan, 2022).

Some success has already been reported in which the metaverse helped attract audiences from all over the world. The example of the first Metaverse Concert by Indian bhangra singer Daler Mehndi we discussed above shows that the metaverse has the potential to help the GS overcome the barriers they face in exporting cultural products. In the same vein, Thailand's first metaverse concert, the Hype Type Metaverse Concert (https://www.hypetype-concert.com/#) was targeted for a global audience. It features non-fungible tokens (NFTs), cryptocurrency and virtual shops. Over $7 million was spent to build the concert's metaverse platform (Nation, 2022).

Immersive technologies are also likely to facilitate the internationalization of visual art. South African mobile telecommunications company MTN purchased land in Africarare. The company plans to provide various forms of content such as gaming and music in order to enhance customers' digital experiences and engagement (Frontier Africa Reports, 2022). Africarare*'s* SingularityU South Africa Summit 2021 in the VR metaverse, which was held on-line from 12 – 15 October 2021, attracted more than 3000 global participants (*Upbeat Africa Ent* 2021). A local artist was able to sell 52 NFTs for US$ 53 000 in digital currency (News24 2021). Based on above discussion, the following propositions are presented:

Proposition 3: VR and AR stimulate the internationalization of cultural products such as concerts that need to be offered by geographically fixed service providers.

Proposition 4: VR and AR stimulate the internationalization of creative tangible products such as art.

4. Discussion and implications

Let us start this section with the research question that we wanted to address, which was: What impact do VR and AR have on the international expansion of services and cultural products? The propositions developed above contribute to addressing the research question by providing insights into the impact of VR and AR, on the international expansion of services and cultural products. For instance, Proposition 1 suggests that AR And VR are more effective in facilitating inward internationalization compared to non-immersive Internet-based platforms. It implies that VR and AR play a crucial role in attracting international audiences and engaging them in a way that traditional online platforms may not. This helps in understanding the effectiveness of VR and AR in expanding services internationally. Likewise, Proposition 2 highlights the disintermediation effect of VR and AR in the tourism industry, indicating that they might be stronger than that of the Internet. Understanding the degree of disintermediation helps in assessing the direct connection between consumers and tourism services through immersive technologies, providing valuable insights into their impact on international expansion. Similarly, Proposition 3 suggests that VR and AR stimulate the internationalization of cultural products like concerts, particularly those offered by geographically fixed service providers. It addresses the specific impact on cultural products and services that traditionally require physical presence, shedding light on how immersive technologies can transcend geographical limitations. Finally, Proposition 4 focuses on the stimulation of internationalization for creative tangible products, such as art, through VR and AR. It provides insights into the role of VR and AR in expanding the reach of creative products globally, offering a perspective on the potential for international

growth in the creative sector. In summary, these propositions collectively contribute to a comprehensive understanding of how VR and AR influence the international expansion of services and cultural products in various sectors, including tourism, cultural events, and the creative industry.

Especially firms in developing nations stand to benefit notably from the application of immersive technologies. Prior research has noted that emerging market multinational corporations (EMNCs) typically possess fewer resources compared to their advanced market multinational corporation (AMNC) counterparts (Ramamurti, 2016). EMNCs, particularly small and medium enterprises (SMEs), thus encounter a broad spectrum of challenges when it comes to expanding internationally (Chandra et al., 2020; Roy et al., 2016). Previous studies have proposed that SMEs face challenges in adeptly managing foreign exchange rate fluctuations, largely attributed to their limited expertise in this domain. Additionally, they confront staffing issues when it comes to their international representative offices (Roy et al., 2016). In the context of African firms, for instance, a significant challenge that has been identified pertains to the limited management and cross-cultural skills, as well as "the liability of Africanness" (Boso et al., 2019). The metaverse can help turning a liability of Africanness into an asset of Africanness.

A related point is that most emerging market multinational corporations (EMNCs) aim to expand into countries that are geographically proximate and share historical and cultural connections (Barnard, 2021). For instance, Africa has witnessed a notable increase in the regionalization of exports. In 2005, as opposed to 1980, African countries were exporting over twice the expected amount to others within their region, considering economic size and bilateral distance (Behar and Manners, 2010). In this regard, immersive technologies can potentially help

EMNCs to expand to countries that are geographically and culturally distant by reducing the resource requirements to internationalize.

Cultural activities constitute a crucial economic sector, gaining significance with the pace of development and remaining substantial even in developing nations. Many worries about the impact of globalization on cultural diversity revolve around the apprehension that the dominance of the U.S. cultural industry could extend further in the global market, especially within the audiovisual sector (Iapadre, 2014). Likewise, the global market for visual art is dominated by artists based in the global North. An analysis of the works displayed at the Museum of Modern Art (MoMA) in New York in 2005 revealed that 62.5 percent of the artists were American, with 5.9 percent representing British artists, 4.4 percent German, 4.4 percent French, 3.7 percent Swiss, 2.9 percent Italian, 2.2 percent Japanese, 2.2 percent Venezuelan, 2.2 percent Brazilian, 1.5 percent Spanish, and 1.5 percent South African (Quemin, 2006). As immersive technologies such as AR and VR continue to advance, they are poised to become a transformative force for artists in the developing world. The above examples illustrate that immersive technologies such as AR and VR have the potential to change this dominance by helping the developing world internationalize cultural products and artifacts such as live concert, music and art.

Immersive technologies such as AR and VR hold a strong appeal for reaching a young audience. Take, for instance, the gaming platform Roblox, where independent developers craft games that resonate with children and young adults. It is argued that Roblox represents the "closest and most expansive vision" of the Metaverse (Herrman & Browning, 2021). In 2021, approximately half of Roblox players were below the age of 13 (Revoredo, 2021), with 66% falling below the age of 16 (Zafar, 2021). Similarly, Epic Games' Fortnite boasted over 350 million registered players in April 2021, with two-thirds of them being young adults (Kshetri,

2022a). unsurprisingly, the initiative of Tourism Authority of Thailand (TAT) anticipates attracting a demographic of younger tourists, constituting 25-30% of overall arrivals, drawn by their digitally oriented lifestyles, including gaming and the collection of digital assets (Bangkok Post. 2023).

4.1 Managerial and policy implications

The findings of this paper have a number of implications for managers involved in international business, especially in inward internationalization activities such as tourism and exports of cultural products and creative tangible products such as art. The above discussion makes it clear that it is becoming increasingly crucial for businesses and governments to incorporate VR and AR within their international business and trade strategies. These technologies' effects on internationalization are higher for cultural products compared to more standardized commodities. As noted above, international tourism is another area that is likely to benefit significantly from the advancement in immersive technologies. Countries such as Maldives, Aruba and Seychelles, which heavily rely on tourism can thus use these technologies as a promotional tool (Frost, 2019).

As noted above, immersive technologies, like VR and AR, can help augment the physical world (Boutenko et al., 2022). The preceding discussion underscores that an elevated utilization of these tools to enhance the real-world experience in tourism-related endeavors can significantly influence tourism intermediaries, including tour agents, wholesalers, online travel agencies, and medical tourism companies. In comparison to traditional e-commerce platforms, immersive technologies such as AR and VR are expected to demonstrate more pronounced disintermediation effects.

Estimates suggested that the global travel intermediaries market was valued at $892.1 million in 2023, which will reach $1190.5 million by 2028 (ResearchAndMarkets.com, 2023).

The cases of Tourism Authority of Thailand and Egypt's General Authority for Health Care discussed above make it clear that tourism services providers such as major hotel chains, and cruise ships and national tourism organizations can take initiatives to increase the use of immersive technologies such as AR and VR to replace some of these intermediaries. The incorporation of AR and VR thus can help destination countries attract additional tourist spending. They aid in travellers' decision-making, showcase broader offerings, and raise awareness of unfamiliar locations (Constantin et al., 2023).

Thus, while AR and VR cannot replicate the experience of physical travel, utilization of virtual spaces to present hotel amenities, airline classes, or entire landmarks has the potential to ignite the desire to travel by providing a comprehensive overview of destinations (Aïdi, 2022; Constantin et al., 2023). In this way, AR and VR technologies can benefit local authorities such as destination management organizations (DMOs) as well as service providers in the travel and hospitality industries, such as airlines and hotels. For instance, VR tourism offers travellers a novel experience with high-quality graphics, immersing them in authentic environments featuring landmarks such as Louvre in Paris, France and Taj Mahal in Agra, Uttar Pradesh, India. These iconic sites transform into diverse virtual experiences such as art exhibitions or social spaces. Historical enthusiasts can explore ancient records on self-guided tours, and attractions can be viewed from multiple angles, replicating an in-person feel. In the metaverse, travellers create avatars, engage in activities like gaming and shopping, and explore exotic destinations globally with friends (Auslander, 2022). These activities have the potential to stimulate international tourists' interest and enhance their willingness to visit the destinations.

National tourism authorities can also harness the power of VR and AR to pioneer innovative approaches in heritage and cultural experiences. For instance, the Royal Commission

for AlUla (RCU) in Saudi Arabia has revealed that the ancient city of Hegra is a part of the metaverse, involving VR (https://www.youtube.com/watch?app=desktop&v=ksMT2QnLPp8). The metaverse enables digital tourists to explore the surroundings, including the Tomb of Lihyan son of Kuza using VR (Constantin et al., 2023).

It is this important for national tourism authorities, local destination management organizations, and service providers in the travel and hospitality industries, including airlines and hotels, to form partnerships with VR and AR companies. These collaborations can help develop and implement diverse solutions to attract international tourists through enhanced and immersive experiences.

Having said this, it should, however, be recognised that not all target tourist market segments are comfortable with AR and VR technologies. As noted above, especially younger tourists are more inclined towards the use of immersive technologies. This means that older tourists still may need the services of tourism intermediaries such as tour agents, wholesalers, online travel agencies and medical tourism companies.

Immersive technologies can also help to increase the exports of special cultural events—such as live performances and concerts, which are mostly delivered by geographically fixed service providers. Consumers are required to physically visit a designated location, frequently the provider's home country, for purchases associated with this service. Although video technologies offer a means to reach a global audience, immersive technologies demonstrate a notably higher effectiveness compared to basic video technologies.

4.2 Future research directions

The framework we have presented in this paper raises many questions that present an opportunity for future investigation. Some potential future research avenues are presented in Table 2.

First, in this paper, the roles of immersive technologies in facilitating "inward internationalization" activities, where customers travel to the service provider's home country to experience locally provided services, are explored. Nevertheless, these technologies can also facilitate the provision of services without requiring customers to travel internationally to the location of the service provider. For instance, real-time healthcare applications such as remote surgery have been provided using immersive technologies. In early 2022, VR and other technologies helped a team of surgeons to separate two conjoined Brazilian twin children with fused brains. A paediatric surgeon from London's Great Ormond Street Hospital directed the surgery on the twins at the Instituto Estadual do Cerebro Paulo Niemeyer in Rio de Janeiro, Brazil, where a surgical team carried out the actual operation (McArdle, 2022). Thus, among the issues to be considered in future research are the similarities and difference in the utilization of immersive technologies across different sectors, particularly when service providers and customers are located in different countries.

In this paper, we mainly focused on the internationalization of services, and cultural products and artifacts. However, the effects of immersive technologies in international business are expected to go beyond international trade. High-profile projects involving immersive technologies such as VR and AR have been initiated by the UAE and Saudi Arabia, with a strong emphasis on attracting foreign investments in this field (Kshetri, 2023a). For instance, in 2022, Saudi Arabia unveiled a $1 billion investment in the futuristic Red Sea megacity NEOM, with a $500 billion budget. NEOM, currently under construction and set for completion by 2025 in its initial phase, is a long-term project spanning 30 to 50 years. NEOM plans to launch its own metaverse, facilitating virtual visits for potential investors and introducing features like 'holographic' parties for residents (*Middle East Eye*, 2022). Saudi Arabia has announced a

strategy to generate $300 billion by selling a 5% stake in the oil giant Saudi Aramco to fund the NEOM project. Despite this initiative, there remains a shortfall of $200 billion (Kshetri, 2023a). likewise, Dubai, one of the seven Emirates of the UAE, is spearheading ambitious metaverse plans. The objective is to attract over 1,000 blockchain and metaverse companies, fostering more than 40,000 virtual jobs by 2030 (Handagama, 2022). Foreign investments associated with immersive technologies thus need to be explored in future research.

While this paper delved into the intriguing contributions of immersive technologies to the internationalization of products or services, it is also crucial to shed light on the internationalization of innovations related to immersive technologies. For instance, the crypto metaverse game Axie Infinity was developed in Vietnam. A study conducted by CashNetUSA revealed that, in 2022 Axie Infinity was available in at least 112 countries (Nicolle, 2022). Likewise, Decentraland, which is arguably the first metaverse to be built on the blockchain, was started by an Argentina-based team. The team had raised $25 million in a 2017 initial coin offering (ICO) (Wilser, 2021). In this regard, a third area of future research might be to examine the pattern of international entrepreneurship activities stimulated by immersive technologies such as VR and AR.

Finally, target consumers in foreign markets using immersive technologies for services or information may differ from those relying on alternative sources and channels (e.g., e-commerce website). Exploring the consumer profile differences, including age, income, media consumption behaviors, and technology adoption, between users and non-users of immersive technologies in foreign markets, could be a meaningful area of investigation.

Table 2: Future Research Areas

	Topic	Research questions

1	Comparison of the utilization of immersive technologies across different sectors	What similarities and distinctions exist in the utilization of immersive technologies across sectors like healthcare and tourism, particularly when service providers and customers are located in different countries?
2	Foreign investments associated with immersive technologies	What specific characteristics make foreign investments in immersive technologies unique when compared to investments in other fields?
3	Internationalization of innovations related to immersive technologies.	Where do entrepreneurial activities related to immersive technologies tend to concentrate? How does the origin and utilization pattern of innovations in immersive technology set itself apart from other technological advancements?
4	Comparing profile differences of users and non-users of immersive technologies	How does the consumer profile, encompassing factors such as age, income, media consumption behaviors, and technology adoption, vary between users and non-users of immersive technologies in foreign markets?

5. Conclusion

In this article, we provided an overview of how businesses have started utilizing immersive technologies in their internationalization efforts. Immersive technologies are especially attractive for exporting cultural products such as films, radio, and books. Technologies like these are proving particularly appealing to firms based in the developing world. Considering the current dominance of U.S.-made products in global entertainment, such as movies and popular music, immersive technologies have the potential to disrupt this status quo. They may serve as a catalyst, enabling firms from the developing world to effectively reach and engage a global audience.

Our work makes a valuable contribution by addressing the limited research on how AR and VR contribute to internationalization. Specifically, our focus centers on the international expansion of services and cultural products. We delve into investigating the specific roles played by AR and VR in facilitating the international expansion of these services and cultural products.

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