

Challenges and Opportunities of Japan's Pop Culture Export in the Context of Globalization: Example of Virtual Idols

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Abstract: The global influence of Japan's virtual idols has garnered significant attention, yet existing studies lack empirical depth and dynamic analysis of their cross-cultural adaptability and socio-technological implications. This essay examines the challenges and opportunities facing Japan's virtual idol exports in the context of globalization. Key findings reveal that cultural barriers, critiques of consumerism and gender objectification, and rising global competition pose critical challenges. Conversely, technological innovations and strategic cultural diplomacy under Japan's "Cool Japan" initiative enable virtual idols to transcend geographical boundaries and serve as soft power tools. To enhance cultural exports, it is recommended that nations integrate localized cultural elements with global trends, leverage participatory fan cultures, and adopt adaptive technological frameworks. This essay underscores the necessity of balancing cultural authenticity with technological advancement to navigate the complexities of global cultural markets effectively.

1 INTRODUCTION

In the context of globalization, Japanese pop culture has spread widely around the world with its unique creativity and attractiveness. Japanese anime, music, games, and other cultural products have attracted countless fans. They are not only popular in Asia, but also in Western countries such as the United States, occupying an important position in the global cultural industry (Iwabuchi, 2002; Kelts, 2006; Otmazgin, 2008). As an emerging representative of Japanese pop culture, virtual idols have been developing rapidly in recent years. From the holographic concerts of Hatsune Miku, to the cross-platform interactions of VTuber Kizuna AI, to the commercial cooperation of the hyper-realistic virtual idol Imma, these non-physical digital stars have not only become an important carrier of Japanese cultural output, but also triggered deep thinking about cultural communication and technological innovation (Anderson, 2021; Le, 2014; Miyake, 2023).

The cultural export of Japanese virtual idols faces many challenges and opportunities, including cultural barriers, criticisms of consumerism, gender materialization, technological dependence, and overseas competitions (Iwabuchi, 2018; Yin et al.,

2025; Kobayashi & Taguchi, 2019). At the same time, the rapid development of technology has provided new opportunities for virtual idol innovation and dissemination. Holographic projection technology has allowed Hatsune Miku's concerts to break through the limitations of physical space, VR interactions have enhanced fan immersion, and AI technology has given the characters more flexible real-time response capabilities. With technology and marketing strategy, virtual idols have become "soft tools" for Japanese cultural diplomacy.

This essay focuses on the cultural export of Japanese virtual idols in the context of globalization, taking Hatsune Miku and Imma as the key cases, and discusses in depth the challenges and opportunities faced by the cultural export of Japanese virtual idols. This essay argues that the export of Japanese culture, including virtual idols, is not only economically significant but also a tool for cultural diplomacy. Through detailed analysis, this essay attempts to show how Japan has reconfigured its cultural communication paradigm in the digital era with the help of virtual idols, and provides references and suggestions for the cultural export of other countries in the future.

2 BACKGROUND OF VIRTUAL IDOLS AND RELEVANT STUDIES

The concept of virtual idols in Japan can be traced back to the 1980s, with early examples including Lynn Minmay from the Japanese anime series *Macross*, who established the precedent of how fictional characters could be hugely successful in the real-world music industry (Kong et al., 2021). The rise of virtual idols in Japan began in the early 21st century, and is centered on a "participatory culture" that breaks through physical limitations. Taking Hatsune Miku as an example, she is a virtual singer launched by Crypton Future Media and based on Vocaloid voice synthesis technology. She started the virtual idol trend through the dissemination of the Internet and social media. Her Fans not only supported her by purchasing albums and concert tickets, but also created a large number of musical compositions featuring Hatsune Miku using Vocaloid software and shared them on online platforms, creating a unique fan culture (Anderson, 2021; Le, 2014). Her image - an anime girl with blue hair and twin ponytails - has become a symbol of Japan's "moe culture". In recent years, the forms of virtual idols have become more diversified. YouTuber Kizuna AI uses real-time motion capture technology to interact with viewers in live broadcasts as an "AI idol", attracting millions of subscribers (Zhou, 2020). The hyper-realistic virtual idol Imma cooperates with luxury brands and beauty brands with a 3D image that is close to a real person, demonstrating the potential of virtual idols in the commercial field (Miyake, 2023). These cases reflect the penetration of Japan's virtual idol industry from subculture to the mainstream market, demonstrating the innovation of expression brought about by technological iterations and their role in cultural export.

There is currently a lot of literature on the Japanese virtual idol, covering many aspects such as its origin and development, cultural influence, marketing model, technology model, and so on, demonstrating the current status and impact of virtual idol development comprehensively. However, the common problem of the literature in this field is the lack of sufficient empirical evidence. After all, virtual idol is a relatively new culture, and most of the studies on it are conducted statistically, with insufficient concern for the dynamic changes of virtual idols in different times and social contexts, so the reliability

and universality of the studies need to be further verified.

3 CHALLENGES OF JAPANESE VIRTUAL IDOLS

3.1 Cultural Difference

Although Japanese virtual idols have made some achievements in cultural export, they also face many challenges. Firstly, cultural differences in different countries and regions may affect the acceptance of Japanese popular culture in the communication process (Iwabuchi, 2018; Yin et al., 2025). Yu, Kwong, and Bannasilp's study found that consumers' acceptance and preferences for virtual idols varied greatly across regions, with factors such as different cultural backgrounds and aesthetic concepts influencing viewers' preferences for idols (Yu et al., 2023). This means that Japanese companies face the challenge of cultural adaptation and audience acceptance when introducing virtual idol culture to international audiences, and virtual idols must take into account the needs of audiences in different regions in terms of image design and interaction methods. For example, "Kawaii" in Japanese aesthetics has received mixed reactions globally (Huang, 2024). The style is more likely to be popular in Asia, but in countries in Europe and the United States, some viewers may consider the style to be too childish or not in line with their aesthetic customs.

3.2 Language Barrier

The language barrier is also a challenge. Japanese virtual idol content relies heavily on the Japanese language, and direct translations often fail to convey the humor and subtle meanings of the original content. For example, in some Japanese virtual idols' music, unique Japanese puns and wordplay contribute to their charm, but when translated into other languages, these fun elements are greatly reduced, making it difficult for foreign viewers to understand the punchlines (Kong et al., 2021). In addition, studies have found that Easterners under collectivist cultures are more inclined to personify non-human entities than Westerners under the influence of individualist cultures, are more likely to project their own emotions and abilities onto others, and are more likely to assume that avatars have mental abilities similar to real people (Letheren et al., 2016; Wu &

Keysar, 2007). Therefore, the promotion of Japanese virtual idols in the European and American markets may be more difficult than in Asian markets such as China.

3.3 Competition

Thirdly, the virtual idol market is highly competitive, with new virtual idols emerging from other countries, posing a threat to the market share of Japanese virtual idols (Yu et al., 2023). For example, the Chinese virtual idol Luo Tianyi, with her unique image combined with traditional Chinese elements, has a large fan base in the Chinese market, with advertising sponsorships reaching as high as US\$138,900 in 2021 (Kong et al., 2021). Virtual idol groups in South Korea are also growing, such as aespa, a girl group launched by SM Entertainment that consists of four real-world members and four virtual-world members, and more purely virtual idol groups such as plave and afots, which have attracted many fans using the influence of K-pop. These virtual idols from other countries have their own characteristics in terms of image design, content creation, and marketing. If Japanese virtual idols want to maintain their position in the international market, they need to continue to innovate and improve their competitiveness.

3.4 Other Criticisms

Some scholars have pointed out that virtual idols may involve problems like consumerism, gender materialization, and technological dependence (Kobayashi & Taguchi, 2019). The business model of virtual idols has prompted fans to purchase a large number of peripheral products, concert tickets, and so on. Some fans, to support their favorite virtual idols, may spend money recklessly. In terms of gender objectification, the image design of some virtual idols has been criticized for emphasizing too much on female appearance, with some virtual idols' clothes being too revealing and their personalities being stereotypical, portraying female characters as objects that satisfy the fantasies of male viewers. This not only limits the diversity of virtual idol roles, but also hurts gender concepts in society. The high dependence of virtual idols on technology also brings risks, and in case of technological failures, such as lagging during live broadcasting, it will seriously affect the audience's experience and even damage the image of the virtual idol (Kobayashi & Taguchi, 2019).

4 OPPORTUNITIES FOR JAPANESE VIRTUAL IDOLS

4.1 Large Market

Hatsune Miku has held world tours with sold-out concerts; her songs, such as the "Levan Polkka," have been widely shared on the internet, with hundreds of millions of plays (Anderson, 2021). In the gaming industry, Miku has the Hatsune Miku: Project DIVA Mega Mix+ series, which allows players to interact with her and enjoy her music (Anderson, 2021).

The influence of virtual idols is not only limited to the entertainment field; it also has significant commercial value. Taking Hatsune Miku as an example, she has co-branded with Toyota and Sony, and directly boosts the consumer market; the data shows that the sales of co-branded products have increased by 20-30% on average (Huang, 2024). Imma has collaborated with international brands such as Porsche, Calvin Klein, Magnum, IKEA, and so on, and she has also appeared on the cover of many fashion and computer magazines (Miyake, 2023).

4.2 Japanese Soft Power

In this context, Japan uses virtual idols as a soft power tool to promote cultural diplomacy. The Japanese government has adopted the "Cool Japan" strategy as a national policy to promote Japanese cultural soft power internationally, which includes the well-known Japanese comics, karaoke, and so on, and virtual idols and cultural IPs are also one of the means to enhance the country's soft power (Iwabuchi, 2018). For example, Hatsune Miku was invited to participate in the promotional campaign for the Tokyo Olympics, and its virtual image was given the symbolic meaning of "connecting the world". Its songs have been widely distributed on the Internet with hundreds of millions of plays, greatly enhancing the international popularity of Japanese pop culture and strongly shaping Japan's vibrant and innovative cultural image (Anderson, 2021). Imma, on the other hand, through her cooperation with international brands, subtly integrates elements of Japanese culture into her brand promotion, conveying Japan's understanding of technology and aesthetics. Her Instagram page is full of photos showing elements of Japanese culture, such as her walking on Enoshima in a traditional kimono and holding the Japanese drink ramune.

It can be seen that the success of these virtual idols is closely related to the widespread popularity

of Japanese popular culture around the world. The widespread popularity of anime, manga, and Japanese video games around the world has attracted a large number of fans who are familiar with and appreciative of the aesthetic concepts and themes embedded in Japanese culture (Iwabuchi, 2002). This established cultural interest and fan base provides a solid foundation for virtual idols to attract new audiences and consolidate existing fan communities. The growing influence and attraction of Japanese pop culture globally have created extremely favorable conditions for the development and spread of virtual idols, and at the same time, they have also contributed to Japanese culture, attracting a wider audience and becoming a unique bridge and business card for Japanese culture to the world.

4.3 New Technology

With the development of technology, Japanese virtual idols are also facing more opportunities on the technical level. For example, the development of 3D holographic projection technology, VR, and AR technology has expanded virtual idols' commercial performances. The previously mentioned Hatsune Miku's concerts used this technology, which allows her to perform as if she were standing on the stage. From the audience's point of view, they can seem to see the idol standing outside of the screen, and this kind of interdimensional performance form can bring a much better interactive experience to the audience. The development of motion capture technology also enables virtual idols to have more vivid movements and more realistic images (Kong et al., 2021). The gesture control technology is also important to the development of virtual idols, which can now make more specific and complex gestures (Kong et al., 2021). More and more individual artists can create virtual images at home with simple motion capture devices, they are called Vtubers (Perry, 2025).

5 IMPLICATIONS AND THE FUTURE

Driven by the trend of globalization, the digital transmission of pop culture has become an irreversible global trend. Japanese virtual idols have been able to break through the traditional limitations of geography and media forms and achieve rapid and wide cultural spread by making use of the Internet, social media, and advanced digital technology. This

indicates that when countries carry out cultural diplomacy in the future, they may consider using virtual idols to make cultural content reach global audiences. Japanese virtual idols cleverly blend local cultural elements with global trends in their image design and content creation, retaining their cultural uniqueness while meeting the diverse aesthetic needs of international audiences. Countries can also create virtual images with distinctive national cultural characteristics, explore the essence of their traditional culture, combine modern popular elements with international cultural trends, and create cultural products with national characteristics that can be widely accepted globally, to enhance the attractiveness and influence of culture in the international market.

Take China's virtual idol development and cultural export as an example. Although there is already a successful virtual idol in China, Luo Tianyi (as mentioned above), she is only famous in China and is still a long way behind Miku's influence. China's recent successful cases in cultural export, such as the game *Black Myth: Wukong* and the movie *Nezha*, have shown that only by exploring the country's traditional cultural symbols can one achieve the goal of cultural export. When China creates virtual idols in the future, it should build a rich backstory for them, consider incorporating national historical events or ancient Chinese myths into them, and portray characters with legendary features that have been adapted in modern ways, so that fans can learn about the idols while being exposed to China's historical heritage. In terms of publicity, Chinese virtual idols can share the process of learning Chinese calligraphy, painting, traditional opera, and other traditional cultural skills on global mainstream social media platforms such as Instagram and TikTok. In brand cooperation, fashion items incorporating traditional Chinese crafts of embroidery and printing should be launched to spread the traditional culture. With the help of global sales, the cultural elements represented by the virtual idol can be spread all over the world. In addition, Miku's success also shows that companies should encourage fans to create content related to virtual idols, such as fan music and fan-videos, to form a unique fan culture.

In the future, as 3D modeling and AI technologies become more advanced, it can be expected that virtual idols will become more integrated into the lives. It can be seen from the popular VTubers' avatars that with the advancement of CGI technology, the image design of avatars has gradually shifted from 2D to 3D,

and the virtual idols can interact with the audience in a three-dimensional way (Perry, 2025). Virtual idols are already shooting commercials and short videos, but perhaps due to cost or technical considerations, it is rare for virtual idols to be involved in full-length movies or TV series. However, it is not unthinkable to imagine that as the technology improves, virtual idols could take the lead roles in movies and TV series. Their 3D models, capable of complex stunts, may create roles that would be difficult for human actors to portray, bringing major transformations to the entertainment industry. With the rapid development of AI in 2024 and early 2025, in the future, AI technology may give virtual idols a higher level of intelligence, allowing them to communicate more naturally and deeply with their fans.

6 CONCLUSION

In conclusion, this essay has systematically examined the dual dynamics of challenges and opportunities shaping Japan's virtual idol exports in the era of globalization, with Hatsune Miku and Imma serving as pivotal case studies. While cultural barriers—such as divergent aesthetic preferences and linguistic nuances constrain global acceptance, Japan's participatory fan cultures enable virtual idols to navigate cross-cultural complexities. Technological advancements, particularly in holography, AI, and VR, are redefining virtual idols' scalability and immersion, allowing them to transcend physical and media boundaries. Japan's "Cool Japan" policy institutionalizes virtual idols as soft power instruments, leveraging their commercial success to reinforce national cultural diplomacy. These insights offer actionable strategies for nations aiming to emulate Japan's success: cultivating fan-driven content ecosystems, embedding traditional symbolism into digital personas, and aligning cultural exports with technological infrastructure development. Future research should explore how AI-driven virtual idols might disrupt creative industries or reshape labor dynamics in entertainment.

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