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**To cite this article:** Góraj, K. (2024). The Impact of Computer-Generated Influencers on Social Media Advertising. *Social Communication. Online Journal*, 1(25), 137-144.

**To link to this article:** <https://doi.org/10.57656/sc-2024-0014>



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Social Communication



Published online: 2 Dec 2024



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UNIVERSITY of INFORMATION  
TECHNOLOGY and MANAGEMENT  
in Rzeszow, POLAND

# The Impact of Computer-Generated Influencers on Social Media Advertising

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virtual influencers, influencer marketing, CGI characters, digital marketing, social media

## ABSTRACT

The paper delves into the new phenomenon of virtual influencers, investigating their rise, impact, and implications for contemporary society. The study aims to determine whether computer-generated influencers can effectively advertise products through social media accounts. The paper describes the concept of influencer marketing in the context of digital marketing. It aims to explain the phenomenon of virtual influencers, i.e., computer-generated characters and their profiles presented on social media. Finally, the results of quantitative and qualitative analyses are presented.

## Introduction

The world is becoming increasingly digital. We rely on the Internet so often that the boundary between the real world and the digital one is gradually fading. Social media's rise has revolutionised how individuals interact, consume information, and make purchasing decisions (Bojanić, 2019). New tools have emerged for both users and companies, becoming a new channel for reaching customers. Social influencers - popular individuals who have amassed significant followings on social media and wield considerable influence over the audience to which they promote products and services - are at the forefront of this digital revolution. Influencer marketing has proven to be an effective strategy for companies to increase brand awareness, engagement, and sales (Kawalec, 2020). The improvement of technology, the Internet and social media created specific kinds of influencers - virtual influencers - computer-generated characters that present their profiles on social media. As it turns out, this opens unlimited possibilities for creators and advertisers, as they can create any type of commercial and anything they want. Virtual influencer accounts on social media set trends and become an inspiration. Furthermore, the process works in reverse: virtual "celebrities" are created.

The phenomenon of virtual influencers raises several questions and concerns. The main goal of this paper is to outline virtual influencers' role in contemporary marketing. The article refers to research on virtual influencers, their history, their impact on society, and their role in marketing and advertising. The article aims to answer the following questions: Does computer-generated graphics gather many observers around them? What makes "celebrities and influencers"? Who is the creator and the recipient of these messages? Above all, what products do virtual influencers advertise, and how is it done? What kind

of brands reach for this type of advertising, and whom do they want to target? Are they exclusively premium brands? How credible are they? How are images published and created on virtual influencers' social media profiles?

## Defining influencers and virtual influencers

As the name suggests, influencers are opinion leaders. (Górecka-Butora, P., Strykowski, P., & Biegun, K., 2019) Influencers can sway consumer opinions and purchasing decisions, making them valuable assets for brands aiming at expanding their reach. This form of marketing allows for a more personalized approach, as influencers can create content that resonates with their audience and does not look like traditional advertising (Whitepress, 2020).

They wield effective influence over their followers, shaping their views, beliefs, choices, and purchasing decisions. They build a loyal following, often thousands or even millions of users who share common interests. Observers very often strongly identify with the influencers they follow. Influencers typically operate on social media channels, run blogs, create vlogs, and share photos. (Kawalec, 2020)

However, it is crucial that influencers have a strong online presence to partner with brands. (Kádeková, Z., & Holienčinová, M., 2018) An influencer often specializes in a specific field and is perceived as an expert. Their success is often determined by their follower count and engagement metrics.

Virtual influencers are computer-generated characters or avatars that are designed to resemble humans visually. These characters are created using 3D graphics, animation, and AI (artificial intelligence) technologies. Teams of creators who script their behaviour, design their appearance, their personalities, styles, also manage virtual influencers' accounts and often through these accounts they

collaborate with real brands for marketing purposes. These avatars do not have to worry about hate or criticism – they do not exist in real life; they are the product of teams of graphic designers. The team of creators makes sure that their profiles describe stories from everyday life and, above all, imitate real life. Such characters, almost like real influencers, show their lifestyle and tell everyday stories. They use social actions and movements to create an emotional relationship with their followers. Their activities, including content creation, audience interaction and product endorsement, are analogous to those of human influencers. However, they offer a unique appeal due to their fictional nature, blurring the lines between reality and fantasy. The other difference between a virtual influencer and their human counterpart is that they are computer-generated characters that look like humans – they do not physically exist. (Darner & Arvidsson, 2019)

There is also the term of a “virtual ambassador”, which is related to a brand. It is a human-like avatar, and this concept refers to a character that is correlated only with a specific brand. Brands use them in communication with customers as brand heroes. Brands create their own influencers who not only promote products on their channels or on the brand’s channels but also build a community of loyal fans. Such influencers are often active on social media as well – Kenna (thisis.kenna) from Essence Cosmetics is an example of social media account of a virtual ambassador.

### A brief history of virtual influencers

The origins of virtual influencers date back to recent years, with their first activities on social media sites like Instagram. However, it can be challenging to pinpoint a single individual as the pioneer of virtual influencers. In the last couple of years, the evolution of 3D led to the development of this technology in computer games, with more and more titles offering the creation of one’s own, often three-dimensional character – an avatar. The availability of CGI software and increased computer speed have made it possible for individual artists and small businesses to produce professional films, games, and artwork from their home computers. (Stamatoula, B., & Kirke, L., 2019). Currently, it can be observed that the creation of virtual avatars has also moved to the web, and above all, to social media. However, several figures and projects have played crucial roles in shaping this trend. Hatsune Miku, a Japanese vocaloid, can be considered a precursor of virtual influencers. Her

debut in 2007 marked a new era in music and popular culture, incorporating electronic music and anime. Hatsune is a Japanese virtual idol, whose image was created by manga artist Kei. It is a phenomenon that allows us to see the importance of technology and media in modern societies. (Sabo A., 2019)

The first notable virtual influencer, Lil Miquela, appeared in 2016 and quickly gained a substantial following on social media platforms. Miquela today is one of the most influential virtual Instagrammers - currently her Instagram account is followed by 2.6 million fans, and among them are well-known bloggers and celebrities. Miquela claims to be a model and music artist - she actively creates music, which she promotes on her channel on the YouTube platform. Miquela is created by two American artists, later founders of the studio, which specializes in creating this type of content. (Bendoni & Danielian, 2019).

### Virtual influencers as an attractive tool for advertisers

The evolution of virtual influencers has been propelled by advancements in computer graphics, enabling the creation of increasingly realistic and engaging digital entities. These entities are not merely static images; they possess the capacity to interact with users in real time, fostering a sense of connection and community. Considering the evolution of virtual influencers from a technological perspective, a key element is the role of artificial intelligence (AI). Artificial intelligence makes the creation of realistic interactions, maximizing engagement and effectiveness of marketing campaigns possible. A virtual avatar can have real-time conversations, respond to a specific person, and create the impression of a personalized interaction. This opens new opportunities in marketing.

Virtual avatars offer creators and advertisers unlimited possibilities by enabling tailored, consistent, and risk-free advertisements anytime and anywhere. Furthermore, advertisers have full control over the messages and the “face” promoting their products. Working with an influencer whose content is entirely designed highly appeals to brands. Collaborating with a virtual influencer is also less risky than working with a real person. Additionally, the convenience of generating advertising messages precisely in line with brand expectations adds to their appeal.

Significantly, we are often unaware of such characters’ existence when we browse social media

posts. Sometimes, we cannot distinguish avatars from real people, making it easy to mistake them for a real person at first glance. This phenomenon often causes numerous controversies and brings publicity to the accounts of such characters, which arouses various social reactions even further. (Góraj, [2020](#))

## Methods

The paper analyses virtual influencers' roles, discourse, and impact on social media platforms using content analysis to identify key patterns in their behaviour and interactions. Content analysis was structured into two parts: quantitative analysis and qualitative analysis. Accounts have been divided into three groups depending on their online activity: virtual influencers, virtual influencers as models, and virtual influencers as brand ambassadors. Several characters were considered – artists, virtual models, lifestyle bloggers and brand heroes. The study analyzed five of the most popular Instagram-based virtual influencers: Miquela (lilmiquela), Imma (imma.gram), Shudu (shudu.gram), Binxie (itsbinxie) and Esther (esther.olofsson). The accounts selected for analysis were the most popular, chosen based on their number of followers and from a variety of countries.

A table of accounts selected for the study was created, presenting information including the post count, the number of followers of the account, the origin, and the date of the first publication. The sample was selected purposefully to choose different influencer accounts, focusing on virtual influencers with significant followings and active brand collaborations across major social media platforms. The study involved a total sample size of N=100 social media posts collected from Instagram. From each account, the 20 most recent posts were selected, starting with the most recent post published on August 29, 2023.

In the second part, the research was conducted

utilizing a qualitative content analysis technique - in this case, comments. The research material used for analysis consists of selected posts from the qualified virtual profiles of the Instagrammers Miquela, Shudu, Binxie, Imma and Esther. The comments posted under these posts by both character creators and observers will be considered.

## Findings – quantitative analysis

Quantitative analysis revealed that 69% of the posts tagged other accounts, while the remaining 31% of the posts were found to have no other accounts tagged.

A “tag” on Instagram is a feature that allows users to identify or mention other users or content within a post, comment, or image. It should be noted that only tags in the photo were taken into account. Tags within the content of the post and in the comments were intentionally excluded to maintain consistency and ensure comparability of the data. The analysis remains directly tied to the visual content by focusing solely on tags within the photo. The majority of the posts analyzed by the selected virtual characters were related to the promotion of various brands. Out of 69 posts with tags analyzed, 93% of photos in the posts had at least one company/brand tag. This high percentage suggests that virtual influencers on Instagram primarily focus on promoting products and services offered by various brands. Their activities are closely tied to marketing and commercial collaboration.

The remaining 7% of posts included tags of another virtual influencer's account or another person/celebrity's account. Such a low percentage indicates that influencers promote creators or celebrities; however, such instances are less frequent compared to the promotion of brands. It may suggest a strategy of concentrating on relationships with brands and establishing long-term partnerships with

**Table 1:**

*Profiles selected for the study*

No.	Account Name	Number of Posts	Number of Followers	Date of First Post	Origin	Creator
1	Lilmiquela	836	2,7M	23/04/2016	United States	Brud.fui
2	Imma.gram	345	248K	12/07/2018	Japan	aww.tokyo
3	Shudu.gram	77	206K	22/04/2017	England	TheDiigitals
4	Itsbinxie	196	84,6K	31/05/2019	United States	Neon Evolution
5	esther.olofsson	252	46K	30/01/2020	Netherlands	RauwCC

*Source: Own work (10/09/20)*

companies. In multi-image posts (galleries), only the tags in the first photo of each post were considered in this analysis to maintain uniformity. Such focus ensured that the same tagging criterion was applied to both single-image Instagram posts and multi-image galleries.

The analysis reveals that a majority of published content consists of single images - 56%. This suggests that account creators primarily post single static images to build their virtual identity. Image galleries follow closely with a 35% share. This content type allows for the presentation of more information in a single post, proving particularly useful for creating more complex narratives or product showcases. Only 9% are videos. It is less than other content, probably because 3D animations are harder to make.

Posts that did not include any tagging (previously mentioned 31% of all analyzed posts) were mostly focused on the influencer's character (in 80% of all such untagged posts, the main attention-getting element was the influencer itself). This suggests that account creators primarily focus on building a strong visual identity for their virtual characters, making them the central focus of their posts.

## Content of the posts

The analysis reveals that fashion-related content dominates the posts, forming the largest category – 27 mentions. This category includes fashion designers promoting the latest collections and online and physical retail stores alongside premium brands.

Physical locations, such as city venues, appear frequently, with 11 mentions, suggesting virtual influencers often show real-world locations.

Interior design ranks as the third most featured category, primarily due to a notable collaboration between the influencer Imma.gram and IKEA in an advertising campaign – eight mentions.

E-commerce platforms are another significant focus, receiving eight mentions, reflecting the growing role of online shopping in influencer marketing.

Brands specializing in cosmetics and accessories, such as jewellery, handbags, shoes, and eyewear, are also prominent in the posts – with seven mentions. The local store category is mentioned five times, indicating that such places still play a significant role in the influencers' promotions.

Artists represent the other group to showcase their works of art and museum exhibitions or collections. Both artists and fashion designers were mentioned four times, demonstrating the strong relationship between influencers and the creative arts. Venues like

pubs and cultural spaces were frequently featured in posts by influencers such as Esther, Imma, and Miquela.

Smaller categories include collaborations with traditional media, such as the press, which appeared twice. Technology brands, notably Samsung, were also present, reflecting their engagement with virtual influencers. Additionally, several posts referenced magazine features: articles, interviews, and photoshoots involving these influencers.

Other elements, such as products, animals, vehicles, or food, appear much less frequently. In advertising messages or those aimed at presenting a product, these virtual characters often appear together with the advertised product. In a few cases, it was the advertised environment in which the characters were located. Their presence is often linked to promoting specific brands or products, indicating a commercial nature of some of the published content. This suggests that account creators aim to create a coherent narrative where the influencer is integral to the promoted message. It is worth adding that a real vehicle also appeared several times as a decorative element and a real animal appeared as well.

The number of characters that appeared in the images analyzed, including real people and other virtual influencers, was also analyzed. In a few cases, there were two and three characters, but the majority of the photos - 87% - show only one character - the virtual influencer itself. Photos featuring two or three characters are of lesser importance - 7% and 3%, respectively. The remaining 3% of the images did not feature any human or its representation.

This may indicate that interactions with other characters, whether real people or other influencers are used less frequently and serve more of a complementary function. The fact that a small percentage of photos have no characters at all may be due to the variety of content published. For example, there may be photos of products, landscapes, or graphics that do not require the presence of a character. The number of sponsored posts, i.e. advertising posts among all the posts considered in the study, was also examined. The majority of posts were not sponsored posts. This means that virtual influencers mainly publish content that is not marked as sponsored, but this does not mean that it is not directly linked to the promotion of specific products or brands. Only 4% of all examined posts were marked as sponsored. This relatively small percentage indicates that although virtual influencers are used in marketing activities, creators do not always make this clear.

The analysis strongly suggests that the largest

proportion - 77% - of published content is lifestyle posts. This suggests that virtual influencers mainly focus on posting life - stories, “selfies”, showcasing their lifestyle, interests and daily activities; creators want to make them more “real”. Photo shoots came second - 15%. They are often linked to the celebrity-fashion side of these accounts, and these influencers are, for instance, high-fashion models promoting interviews or related press releases. Other content types, such as advertisements (7%) and social shares (1%), occur much less frequently. The presence of advertisements indicates the commercial dimension of influencers’ activities. Such influencers are also involved in socially relevant topics.

A further element of the study was comparing the two distinguished groups of posts and their respective like-count: (i) with brand tags and (ii) without any brand tags. In order to present the results, the five most popular posts with brand tagged and the five most popular posts without any tags were selected. The indicator for popularity was the number of likes for each post. The data reveals a nuanced relationship between sponsored content and engagement. While there is some variation between individual posts, posts without brand mentions generally garner slightly more likes than those with brand mentions. This suggests that while sponsored content can still generate significant engagement, authentic, organic content may resonate more strongly with the audience. That could be why posts are not marked as sponsored, even though they still advertise a product. However, it is crucial to note that the difference in likes between the two groups is relatively small, indicating that both types of content can be effective in engagement. The slight edge in favour of organic content could be attributed to factors such as perceived authenticity, stronger connections with the influencer’s persona, or a general preference for content that is not overtly promotional. Nevertheless, the data also highlights the potential of sponsored content to reach a wider audience and generate revenue for influencers. Further analysis could delve into the specific characteristics of the most successful sponsored posts, such as the nature of the brand partnership, the relevance of the product to the influencer’s audience, and the overall quality of the creative content.

## Creators

Initial anonymousness of the authors of virtual influencers is a common trait, presumably to create audience fascination and mystery around the created character. Currently, most of the identities behind

virtual influencers have been revealed, but when starting to publish on their characters’ profiles, their creators are often completely anonymous. The fact of the unknown behind the characters as well as the unknown source of their voice, arouses interest and generates much controversy. However, such cases have already happened in the world of celebrities, e.g. SIA or Daft Punk, who have kept their identities secret while being famous.

## The overt and covert idea

It can certainly be said that humans do not run each of these accounts. It is just an avatar, while many of them present themselves as a robot, which is an overt idea. The idea hidden in this message may be that influencers do not exist; all creations are created by agencies, artists or photographers, often through combinations of photographs with 3D or computer-generated graphics. Furthermore, the audience and the characters tend to fall for the virtually created relationship and play their roles. The audience assumes the role of an active follower and engages in real conversations or interactions with the character – and the character assumes the role of a real person by mimicking typically human behaviours and habits.

What is more, the messages and situations posted on influencer profiles are orchestrated and created by some person or group of people - most influencers were created to gather audience groups on Instagram, establish partnerships, advertise products, and thus earn money, which goes into the pockets of the creators. These graphic creations interact with observers or other CGI/AI characters on social media platforms. They undertake activities such as meeting celebrities or real influencers, engaging in interviews, speaking on a specific issue, creating sponsored content, and modelling. (Bendoni W., Danielian, F., 2019)

Despite the clear use of CGI in some Instagram profiles, people are still being misled into thinking the characters are real. Even though it is obvious that they are computer-generated characters, e.g. Miquela – doubts persist. Some articles often mention that these profiles are created using graphic programs and available tools.

## Findings – qualitative analysis

In order to showcase the most interesting reactions and interactions between the audience and characters, various comments were selected, and accordingly, a following summary was made. There are many

questions - most of which are asked as if they were addressed to real people on the profiles of virtual influencers. Followers ask questions about the characters' favourite places to drink their favourite coffee, how they care for their hair, what they like to eat for breakfast, or what their morning routine looks like. There was even a comment about the character's height and the length of the dress advertised in the post. This, however, was met with a negative reaction from another viewer, but as the previous speaker said in response, "Robots also have some height."

Virtual characters often refer to themselves as "robots," which is often misleading to viewers because they are simply heads or 3D models placed in a photograph or a film - the characters in the messages appear in static or animated form. It can be assumed that they are made with exactly the same technologies as characters for movies or games. On their profiles, they show their business ambitions, release singles, and pursue music careers - like Miquela.

Unfortunately, such messages are not authentic, and the creators deliberately mislead viewers to get the audience's attention. Interestingly, audiences, whether aware of it or not, also often compliment the characters: "You're beautiful". Followers become part of the story. In general, most audiences of CGI influencers address them as if they were people. A significant number of comments constitute compliments on their choice of clothing, appearance, and beauty. Viewers get quite "human" answers to questions asked in this way very often. Characters on their profiles conduct a narrative and respond to interested viewers.

Virtual characters are often very active in discussions and very often respond to comments. They also have email addresses and often respond to messages, and in addition, they publish many comments on their profile. Each of the characters tells their story on their profile. The story is constructed in such a way as to engage the viewer and, above all, to arouse curiosity in the audience. Observers are curious to see what kind of posts their virtual favourites will publish and what kind of stories their creators will create.

Virtual characters present a vision of an ideal "life". They meet with friends, go on luxurious trips, pose, and party or wear clothes of famous designers, and their careers develop often. In addition, these artificial characters have their own complex personality generated by the creators, which they are eager to make visible on their profiles. Such actions affect the emotions and engagement of observers. Recipients quite mistakenly wonder what the virtual

characters are made of and how it is possible that they are able to eat or feel anything. Questions like this, "Are your bones also made of plastic?" can be found rather frequently. The character's messages, both the pictures and the descriptions underneath them, often try to replicate human behaviour. Characters talk about their emotions, complain about allergies or feeling unwell, as if they were human.

When Miquela appeared on Instagram, her appearance was decidedly less realistic. Her skin was pale, and her hair looked artificial. Because of this, there were many questions from observers. In the case of Miquela, observers speculated whether Miquela's character was a mixture of a real photograph and advanced digital technology. There were claims that her facial features were exaggerated, her fringe unnaturally even - doll-like- and that she resembled a game character or something between an avatar and a sim. There have also been accusations and doubts - it has been noted that her downy hair always falls in the same way, and her skin is incredibly smooth. There has also been speculation that Miquela is a student art project by a visual arts student. There were also opinions in the comments that the girl was a thoughtful product of some company trying to promote itself. Some people claim she is real, but she edits her photos using 3D software. By confessing the truth, the creators of Miquela have made viewers realize that Miquela's story is fiction. Even though Miquela has revealed secrets, there are still questions about whether she is real. The question: "are you a robot?" still arises, although it is so easy to find the answer to this question.

Imma's posts include questions like: 'are you real?' Despite Imma's use of the hashtags #CGI and #ithinkImCGI, many questions of this type can be seen in her posts. Interestingly, such a situation also appears under the posts of other influencers. Virtual influencers are created using flat or 3D motion graphics. However, articles about them being driven by artificial intelligence can be found on the Internet. This is not the case, but it inspires creators to develop influencers in this direction. According to some, the future of virtual beings is to be powered by artificial intelligence - through a combination of computer-generated images and AI capabilities. Companies want to create influencers that do not require any human involvement. An additional issue is that the images are easily mistaken for real people, especially on the small screen of a mobile device, which adds to the growth of doubt. The creators of Instagram photos take care of every detail and fine-tune the graphics to make the influencers look as natural as

possible. Often, companies create the message in this direction, causing much controversy and arousing the viewer's curiosity, which makes their popularity grow, and money for advertising is earned by the companies or the creators of such an influencer.

## Conclusions

The research investigated the emergence and impact of virtual influencers on contemporary society, utilizing a qualitative approach to gather insights from social media users. The study highlighted the growing role of virtual influencers in digital marketing strategies and consumer engagement through content analysis of social media platforms. Findings revealed that these digital personas not only attract substantial followings but also can uniquely advertise and shape brand perceptions and consumer behaviours. Additionally,

the research identified audience reactions, illustrating how virtual influencers challenge conventional notions of celebrity and authenticity in the digital age. Overall, the study contributes to a more profound understanding of the evolving landscape of social media influence and its broader societal implications. Virtual influencers represent a significant shift in digital marketing strategies, offering brands unprecedented control over their messaging and image. As technology advances, particularly in areas like artificial intelligence, the line between virtual and real influencers may become even more blurred. This evolution challenges marketers, consumers, and regulators to navigate a new landscape where reality and digital creation intersect. The phenomenon of virtual influencers reflects current technological capabilities and signals a potential future direction for digital marketing and social media engagement.

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