

Hatsune Miku and the Double Nature of Voice Library Software: Content Consumption and Production in Japan

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Abstract

Hatsune Miku, a software conceived to produce songs, has evolved as a fictional character in the hands of its users since its release in 2007, prompting the development of a strong identity around her image and initiating an innovative movement of amateur content production. In this paper, I examine the software Hatsune Miku, developed by Crypton, and its double nature as a character and as software. I argue that while the influence of Dwango's video sharing website Nico Nico Dōga (today Nico Nico) and the development of participatory culture on the internet were also decisive factors, it was this double nature that encouraged in a rather natural way the development of a stance towards, and later, a legal framework for, the intellectual property of voice characters like Hatsune Miku. This legal framework transformed the scene of content production and consumption in Japan by allowing not only free appropriation of the fictional character by users, but also its re-appropriation by companies for commercial exploitation. By focusing on how the de-appropriation and re-appropriation schema used by Crypton developed, this paper aims to explain recent transformations in Japanese content production and consumption.

Keywords

Vocaloid, Hatsune Miku, Fan production, Content industry

Introduction

Defined in narrow terms, Vocaloid is a genre of amateur songs produced using the Vocaloid software, developed by Yamaha Corporation, and its voice libraries, among which the most famous is Hatsune Miku, developed by Crypton Future Media, Inc. In a broader sense, the Vocaloid scene also encompasses all kinds of derivative creations related to these amateur songs or the fictional characters that give identities to the voice libraries. Examples of such derivative creations include content posted on internet platforms like Nico Nico or Pixiv, music animation videos, fan produced music albums, covers, dancing videos, illustrations, parodies, or cosplay pictures.

Beyond the amateur scene and the endless network of derivative productions, the Vocaloid scene also encompasses albums of some of the most popular songs or creators released by professional labels such as Sony Music or Victor RCA, and the production of the video game *Project Diva* by SEGA, which uses popular songs or designs of characters created by amateurs. The reach of Vocaloid-related content has also expanded to commercials and campaigns of many kinds, such as commercials for Toyota Corolla in the US (released in May 2011), a Google Chrome TV commercial titled 'Everyone, Creator' featuring Hatsune Miku and the theme song 'Tell Your World' by kz (released in Decem-

ber 2011), and a Japanese Domino's Pizza app featuring Hatsune Miku (released in March 2013). As in the case of *Project Diva*, on several occasions some of the Vocaloid genre-related content in the commercials was produced in collaboration with amateur producers.

Around 2014, Vocaloid expanded from being an underground genre of amateur music production to a media phenomenon where amateur content creation gained much attention. The fictional character Hatsune Miku was at the center of this phenomenon. Miku concerts were produced by Crypton and SEGA, where computer graphic models of Miku and other Vocaloid library characters produced by Crypton were projected onto transparent surfaces on a stage shared with live musicians, giving the impression of a hologram. Concerts were produced using popular songs that originated from the amateur scene, but mainstream singers such as Bump of Chicken (WILPOLIS 2014 Japan tour), Lady Gaga (ARTPOP Ball tour 2014), and the electronic music producer Tomita Isao also produced concerts with Hatsune Miku (2012). Through this process, Vocaloid and Hatsune Miku transformed into another icon of mass pop culture in contemporary Japan. Although in recent times Hatsune Miku and Vocaloid's popularity in the mainstream media has decreased, it continues to shape a huge network of content, creators and fans.

In this paper I focus on the development of the Vocaloid scene before Dwango (the company that launched Nico Nico) and Kadokawa merged in 2014, examining the way in which the popularity of Vocaloid voice libraries emerged. To do so, I will also present commentary from some of the key actors in the Vocaloid industry. From my own interviews, I include the perspectives of Kenmochi Hideki, from Yamaha, the developer of Vocaloid technology; a member of the advertising department at Crypton who remained anonymous; and the perspective of Murakami Noboru, President of Internet Co., Ltd., another company that produces popular voice libraries. I also examine commentary from Itō Hiroyuki, the CEO of Crypton, and Sasaki Wataru, who was in charge of developing the voice library Hatsune Miku, gathered from interviews published among the vast amount of information in Japanese on this topic. Given that here, my focus is on the systems developed by these companies, led by Crypton, I have not included the perspectives of users. An exploration of user activities will be presented in a forthcoming paper.

My examination of the role of the character is focused on its nature as content in relation to intellectual property. A broader consideration of the role of fictional characters in the imaginary and affective lives of users, or a more comprehensive discussion on the relationship between characters like Hatsune Miku and idol culture or *bishōjo* games in Japan, although beyond the aims of this paper, would complement the rather narrow perspective I take here. However, the focus this paper gives to concrete examples of the infrastructure behind Hatsune Miku and how it developed will hopefully provide a platform for further discussion on content production and consumption.

The material I present here is part of a research project on Vocaloid and *dōjin* culture in Japan that I began in 2010. I did most of the research on Vocaloid from 2013 to 2015, including 24 interviews with key actors from different parts of the Vocaloid scene. This paper is a reworking of some parts of the fourth chapter of my PhD dissertation (Hernández, 2016). I focus on Crypton and the development of Hatsune Miku's technosocial environment in order to argue that the commercialization of amateur content in mainstream media, here through the system of collaboration fostered by Crypton, was made possible due to the double nature of voice libraries both as tools and as fictional characters. Crypton itself has acknowledged this double nature by defining voice libraries as an *interface* or *platform*, as well as through the release of a licence that enables not only the free appropriation of a voice library character by users, but also its re-appropriation by Crypton for commercial use. However, to date there has been no exposition on this double nature of vocaloid voice libraries that focuses on how industrial practices and fan appropriation developed together. Therefore, my aim here is to examine the specific technical nature of Vocaloid as a technology for fostering amateur productivity in the mainstream media and provide concrete examples of how this was accomplished.

Despite the limited number of academic sources in English, Vocaloid and Hatsune Miku is a topic already heavily discussed. In a relatively recent example of previous research in English, Leavitt et al. (2016) examine the Vocaloid phenomenon from the perspective of media convergence or media participation.

They follow the rich tradition in fan and media studies of showing how media technology, media industry and enthusiasts are linked together through *participation*, a term that is used to describe the nature of the core element of present-day media cultures. For such an approach, the work of Henry Jenkins on participatory culture (see, for example, Jenkins, 1992, 2006; and Jenkins et al., 2013), becomes highly relevant. Moreover, Hatsune Miku is the perfect example for examination because, as Leavitt et al. state, Miku is precisely “the result of creative peer production” (2016, para. 2).

Jenkins' work on the participatory nature of fan culture engages with the politics of communication, and in particular the role of media participation as empowerment (see for example the discussions collected in Jenkins & Ito, 2015). In a similar spirit, Ian Condry (2011) examines a live performance by Hatsune Miku, drawing attention to the social nature of Hatsune Miku's image, and identifies a clear link between media openness and what he calls “distributed collective action” (para. 6) or “distributed creativity” (para. 13) taking place in the democratic environment of participation. Moreover, he sees this relation between collective action, technology and media culture as one product of new *open* media platforms, and considers Hatsune Miku as one such platform. For Condry, Hatsune Miku is an open platform which, rather than focusing on representation, prompts action and therefore brings the democratic potential of media to the fore, allowing us to imagine new ways to create what he calls “communities of action” (para. 17).

In turn, many of these insights are in tune with research on the new possibilities in communication and action that information technologies are bringing about. A relevant example in this field is the work of Laurence Lessig (2004, 2006) on the uses of media cultures on the internet, which builds a framework to re-define intellectual property and commons for the purposes of these new technologies. The work of Pierre Lévy on collective intelligence (2013), which focuses on the managerial capacity of communities – regarded as “knowledge ecosystems” (p.101) – to maximize the production of knowledge also reassesses how information is collectively produced within platforms such as YouTube or Flickr. There is also earlier research that is particularly relevant in terms of shaping the corpus that has theorized media participation and information technologies, such as Alvin Toffler's *The Third Wave* (1980), which introduces the word *prosumption*, a fusion of consumption and production in a context he characterized as post-industrial.

It is important to note that both the scholars who have created theoretical frameworks to discuss Vocaloid as well as Vocaloid practitioners themselves have been influenced by research on media and communication. For example, Hamano Satoshi (2008, 2012) borrows from Lessig the word *architectures* to analyze how the website Nico Nico Dōga (today Nico Nico) prompted what he calls *N-order creations* (2012), which are something similar to what Leavitt et al. call *peer production* (2016). In terms of the people that built the technosocial infrastructure of Vocaloid, Crypton's CEO Itō Hiroyuki himself revealed his own theoretical literacy when he named one of his company websites Karent (discussed below), after Alvin Toffler's daughter, Karen Toffler (Uchida, 2013; Karent, n.d.).

There is therefore, to some extent, a kind of self-fulfilling

circle in the interplay between media production and enthusiast practices, and the theory itself, which is particularly easy to track in the case of Vocaloid and Hatsune Miku. It is within this context that this paper aims, where possible, not to theorize but rather to show how aspects of the content production process already theorized in the research actually took form by focusing on a small but central element, the development and use of Hatsune Miku.

The Cultural Crossroad Behind the Vocaloid Scene

As a voice synthesiser, Vocaloid software allows users to use a vocal database recorded by a real person to perform as a singer. There are several voice databases or libraries developed by different companies. The most popular library among them is called Hatsune Miku, which features a Japanese animation-like character who is a 16-year-old girl. It was developed by Crypton Future Media using the technology of Yamaha's Vocaloid 2 and Vocaloid 3 software.

Users of the software can 'make the character sing' any lyrics they want. Therefore, the final product is usually a song performed by the fictional character of the library (i.e. Hatsune Miku) and commonly composed by the user. In many cases, this song is presented along with a video, which is also produced by the user or in collaboration with another user. The complexity of the video may range from a static image of the character to very complex 3D animation where the character dances and sings. These musical videos are released on the internet by creators under a pen name or nickname. Creators take on the role of producers (called 'vocalo p'), and, in many cases, their names are followed by the letter 'p' as an abbreviation for 'producer' (E.g. Kurosua-P, Akuno-P). Since Hatsune Miku was launched on the market in August 2007, the main showcase where Vocaloid producers show and share their productions with other users has been the Japanese video sharing website Nico Nico Dōga (today Niconico), which was launched at the beginning of the same year. Vocaloid technology, fictional characters like Hatsune Miku, and media platforms like Nico Nico Dōga, along with their users, are the main components of the core structure of the Vocaloid scene.

The environment in which this Vocaloid scene was born can be described as a cultural crossroad, where many different elements have merged. Some of the main participants in this merging include technology and DeskTop Music enthusiasts, internet and *dōjin* subcultures, and anime and character fans. DeskTop Music or DTM is the name of amateur electronic music in Japan, which is mainly produced using personal computers. This culture in Japan was established in the late 1970s and during the first half of the 1980s, following a decrease in the cost of digital synthesisers. The spread of personal computers and the MIDI standard, as well as the commercialisation of cassette tape recorders and other technical improvements in music production and reproduction, allowed the formation of an active group of electronic music enthusiasts (Shiba, 2014). The word DTM was used for the first time in 1988 for a cheap Roland synthesiser (Ideguchi, 2012). However, Shiba Tomonori has traced the roots of this culture back to hippie and counter-culture movements in

the United States in the 1960s, and to the club music and rave culture in the 1980s in the United Kingdom (Shiba, 2014).

The links between the early Vocaloid scene, Japanese DTM and the abovementioned cultural movements in the United States and the United Kingdom have multiple roots. One of these roots can be found in the connections between technology enthusiasts and counter-culture, which as Castells has pointed out, were central in the development of the internet and personal computers during the birth of the 'information society' (1996). These groups have a natural link with science fiction enthusiasts who, as Yoshimoto (2009) has documented, have had an active presence in Japan at least since the 1950s, when some of the first science fiction clubs were established. Shiba asserts that the same spirit that drove 1967's 'first summer of love' in San Francisco and the 'second summer of love' in Britain in the late 1980s was also the backbone of the Vocaloid movement (2014). However, I regard these roots more as the cultural substrata which supported the rise of the Vocaloid scene after 2007. This is because other accounts of the Vocaloid scene, including my own research and that by Shiba, show that the development of the Vocaloid scene can be more directly linked to key people in record companies, software developers and musicians like Tomita Isao (Shiba, 2014).

Following Ideguchi (2012), DTM culture can be classified as a kind of amateur *dōjin* music culture, focused only on computer-generated music. Ideguchi's analysis closely follows the development of *dōjin* music, which is part of the institutions and practices we may describe as *dōjin* productivity, although these activities are not necessarily related to the stereotype of otaku. As Ideguchi points out, DTM culture has its points of divergence from *dōjin* music (2012). In contrast to *dōjin* music, DTM music is not as closely related to activities like parodies or second creations. When in the 1980s club music became popular in Japan, and with the influence of house music, the practice of mixing and editing music also became popular. This kind of creativity is, however, different from *dōjin* productivity, which has a clear relation to the original or previous work. Moreover, in DTM as in hip-hop culture, the original is not necessarily the most valued work (Kanose & Barubora, 2005). In any case, DTM as a particular technique or way to create music using computers can be regarded as another practice absorbed by the logic of *dōjin* productivity. The rise of the so-called MIDI movement, at the beginning of 2000, is another example of such a process.

As Masaki Yoshiaki, a representative of the Vocaloid fan organisation 'Mirai no neiro', and the Vocaloid producer and media writer Kobayashi Onyx have pointed out in interviews with the author, the MIDI movement should be regarded as a key antecedent of the Vocaloid scene and as a major factor in the scene's first stage of explosive popularity after 2007. The MIDI movement was essentially the activities of MIDI music enthusiasts who reproduced their favourite songs and music in MIDI format. They posted links to their creations on massive internet billboards like the famous 2Channel, where they also shared technical information and conversed. The relationships formed on the internet around these practices shaped a particular community of peers with a special feeling of belonging. This movement, however, ended abruptly due to what members of this culture have called 'the MIDI eradication incident'. This

eradication was undertaken by the Japanese Society for Rights of Authors, Composers, and Publishers (JASRAC) because of intellectual property infringements.

Another practice related to the origins of the Vocaloid scene is the subgenre of *dōjin* music based on 'cute girl games (*bishōjo gēmu*)'. These video games are a kind of dating simulation centred on pretty anime-like girl characters. As Ideguchi argues, at the end of the 1990s, an important segment of supporters of *dōjin* music comprised young males who liked to play these popular games. At the same time, many game companies approved the production of derivative works or secondary productions of the music of their games (Ideguchi, 2012, pp.40-1).

We can find one example of these practices in the *dōjin* music based on popular games from the visual novel studios Leaf (Aquaplus) and Key (VisualArts). The popularity of both the games and their derivative works has led to the use of the term 'Leaf-Key' by fans, a term that also refers to a specific genre of derivative works. Another example of a popular genre in *dōjin* music is work based on the *Touhou Project*, a popular amateur shooter game developed by the game programmer Zun (Ōta Junya). The large quantity of secondary productions in *dōjin* music related to these two genres makes clear the strong relation between amateur music production and the use of 'cute girl' computer games (Ideguchi, 2012; Tomita, 2008). It is also important to note the significant role played by the open attitudes of the abovementioned game software companies or creators towards intellectual property. The case of *Touhou Project* is again a representative example. The *Touhou Project* is perhaps the most long-standing and popular genre in the Japanese *dōjin* world. Zun, its creator, has maintained the status of his software as *dōjin* and has therefore avoided copyright issues. This open attitude towards intellectual property and the popularity of *dōjin* music based on games marks a similarity to anime-like character culture. As Ideguchi (2012) notes, the large number of CD jackets depicting beautiful anime-like female characters at *dōjin* music events like M3 leaves no room to doubt this connection.

The last factor that emerged in 2007 to give shape to the Vocaloid scene was the rising culture of internet platforms, and practices on those platforms that may be described as chains of parodies, exemplified by MMD or mash-up videos, hosted and made possible by what was at that time the recently launched video sharing website Nico Nico Dōga (currently Niconico). Some of Niconico's characteristics have been already addressed from the perspective of Kadokawa in Hernández (2018). Although Vocaloid networks were already developing before Nico Nico Dōga, the popularization of the website after 2007 coincided with the appearance of Vocaloid's most famous software.

The Impact of Hatsune Miku

Vocaloid software allows the user to input lyrics in a piano roll style interface. The software engine synthesises a voice, recorded from a real person and stored in a database, and the output is a singing voice of surprisingly good quality. Kenmochi Hideki, the developer of the software and former leader of the Vocaloid division at Yamaha, describes its characteristics in the following way:

The software development began in 2000. [...] I began the development and, well, if you ask me what my goals were, I didn't imagine it would become anything like it is now, with Hatsune Miku or people listening to Vocaloid songs. It was designed simply for the music industry or for the field of music production. In the case of a professional producer, they can just call a singer [...]. So it was designed for the previous stage, of pre-production, or demo songs. It was for provisional songs in those two cases, before having to call a real singer [...]. I began the development hoping people could use it in that way. Just as a very specialised music production tool (Kenmochi Hideki, personal communication, March 28, 2014).

While many musical instruments had begun to be synthesised using computers, the tone of the singing voice had not. Then voice synthesising was initiated in the early 1960s at AT&T Bell Laboratories. In the 1990s, there were many examples of software in Japan that could synthesise a singing voice. However, the quality was poor and the software was not used in the field of music production; instead they were used in games (SHD, 2011; Kenmochi, 2012; Shiba, 2014).

The focal points in the development of the software were as follows: 1) intelligibility, so that the lyrics were comprehensible, 2) naturalness, to reproduce the peculiarity of human singing and 3) operability, to establish user-friendliness in song production. The Vocaloid synthesising system has the following components: 1) a user interface to input the lyrics and the notes, 2) a voice library composed of phonemes recorded from a real singing voice and 3) a synthesiser engine that selects and connects the phonemes from the library (Kenmochi, 2012). Based on this technology, Vocaloid was introduced in February 2003. In January 2004, the British company Zero-G Ltd introduced the first Vocaloid libraries Leon and Lola in English in the United States. Those libraries were commercialised in Japan by Crypton Future Media in April of the same year. The first Japanese Vocaloid library was Meiko, introduced by Crypton in November 2004 after another English library, Miriam, was released. In its first year, the software recorded sales of 3,000 copies, which for the DTM software market at the time was an exceptional success (SHD, 2011).

The voice synthesiser software developed by Yamaha became another product among the many musical instruments already developed by the company. However, as a musical instrument, it was a peculiar one. By incorporating a real human voice into the system, the result was a true hybrid between human and machine. This particular nature of the product would play an interesting role in the imagination of software users. Almost all the libraries had human names, but as Kenmochi emphasises, the intention was never to create a virtual singer. Vocaloid was meant to be a tool, but it turned out that this tool enabled ways of expression and uses unexpected by its creators:

Considering it now from this current perspective, we thought of it as a substitute for a human singing voice, but, in reality, it was not only that [...]. If I think about it now, I think there are some kinds of expressions you

cannot have if you are not using Vocaloid, right? To put it superficially, things like singing very fast or with a very high-pitched voice. There are things like that. But, in the end, it was the lyrics, right? They are quite unconventional lyrics that you don't have in current J-pop or related fields (Kenmochi Hideki, personal communication, March 28, 2014).

As Tomita (2008) remarks about the world of *dōjin* music, before Vocaloid was launched in 2003, there was no way to produce songs other than by asking a singer to sing, or by singing yourself. Technological innovations (synthesisers, personal computers, the internet) had lowered the hurdles in DTM production, and consequently, the number of enthusiasts engaged in the hobby was increasing when the Vocaloid software appeared. However, in contrast, the number of singers available was not increasing. There were, therefore, a significant number of amateur creators wanting to create music and in need of somebody to sing for them (Tomita, 2008). They were the people behind the modest success of the Vocaloid library Meiko. However, at the time of Meiko's release in 2004, it was not yet possible for the development of the movement that contributed to the explosive popularity of the Vocaloid on the internet. This environment was not established until 2007, a few months before the commercialisation of the Hatsune Miku library, with the rise of internet platforms.

As Kenmochi remembers, after the Hatsune Miku software was released, the reaction was substantial. Just after it was put on sale, at the end of August 2007, it appeared on the Nico Nico Dōga video-sharing site, and a great quantity of people uploaded songs or even what Kenmochi describes as "weird things you cannot call songs" using Hatsune Miku.

...it was around August and the beginning of September. As you may expect, there were a lot of cover songs. [...] But only one or two weeks later, one after another people began uploading original songs. Now, I think that more than half of the users are uploading original songs. [At that time], I was just surprised and thought, 'This is great!'. I just realised that there were lots of people wanting to make songs, wanting a place to share them. And with lyrics! I now realise those people were wanting to make songs with lyrics, but they were not able to do so (Kenmochi Hideki, personal communication, March 28, 2014).

When Kenmochi talks about Vocaloid as a culture, his emphasis is above all on the lyrics. For him, there was an increasing amount of people who wanted to express themselves through their song lyrics but had no room to do so, not only in the mainstream music industry, but also in any other way. Among the first wave of Vocaloid music, there was a significant number of songs with lyrics addressing bullying, disappearances, or suicide, or that presented a harshly ironical view of life. Importantly, digital technology provided the means to produce from scratch and distribute songs with complete anonymity.

Crypton introduced the Hatsune Miku software for Vocaloid 2 on the 17th of August, 2007, and released it on the 31st of the

same month. It was the first software of the Character Vocal (CV) Series. Only three months later, it was described as a "revolution in the DTM scene" and Hatsune Miku was referred to as a "miraculous diva" (Maeda & Hiraiwa, 2007, para. 2). The software achieved sales of over 40,000 copies in the first year, becoming a megahit in its sector (SHD, 2011).

The 'Hatsune Miku miracle' was also an unexpected success for its developers. According to Kenmochi, by 2007 the Vocaloid software was not selling well, and the development team had been reduced to two people, including him. It was while discussing these difficulties with Crypton that they decided to "make something interesting before the end". The idea proposed by Crypton was to "make a synthesised voice sing like a virtual girl" (Kenmochi, 2013, para. 5). Sasaki Wataru, the employee at Crypton who was in charge of the development of Hatsune Miku, also remembers 2007 as a difficult year, as there was a continuous stagnation in the music industry in general. The idea of abandoning the Vocaloid project was also in the air (Shiba, 2014).

The Voice and the Image: Software with Cute Identity

The attempt to develop the new Hatsune Miku software was pushed by a feeling of crisis. Itō Hiroyuki, the representative director of Crypton, has stated that he did not have any particular connection with or understanding of otaku or character culture. However, from the beginning of the project, they had planned to use, in the case of Hatsune Miku's voice, a voice from an actor like those who work in the animation industry, rather than a singer.

The new challenge for the developers of Hatsune Miku was producing a character, which would then be commercialised as the first of the CV series. The selection of a voice that expressed the personality of that character was one of the first stages of development. In the words of Sasaki Wataru, "We were looking for a so-called 'Lolita voice' [...] a voice that conveyed, 'I am cute'" (as cited in Shiba, 2014, pp.104-5). As Itō recalls,

Because Vocaloid 2 Hatsune Miku was developed using the recorded voice of Fujita Saki, who is a voice actress for animation, the main characteristic is that the software makes it possible to synthesise a cute girl's voice. In order to reinforce this characteristic visually, we used a character illustration of the kind that appears in animation on the software package (2012, p.477).

The person in charge of drawing the Hatsune Miku character was the illustrator KEI. When he was asked to join the project the concept was still unclear, but, as he relates, the design started by focusing on two elements: the use in Miku's character design of some visual characteristics of the Yamaha DX7 synthesiser, and the depiction of a "near futuristic" atmosphere (Maeda & Hiraiwa, 2007, para. 18). As Sasaki has commented, they chose to work with KEI because his illustrations evoke a feeling of "inorganic matter" (2008, p.12). KEI illustrations portray the qualities of cute animation characters but lack what Sasaki regards as *moe*: a sensuality that evokes the flesh of the body. For

Sasaki, “physical embodiment (*nikutaisei*) and Vocaloid are two entirely different things” (2008, p.12). They were searching for something more inorganic and machine-like.

In addition to this concept, there was also a marketing strategy. Hatsune Miku was produced as the combination of a *character* and *software*. Itō expresses it in a direct way:

We wanted to sell a lot, so, to start with, we decided to create a character. But I thought that if its features were too overtly moe, perhaps the music fans would not accept it. So, we created the character illustration while also trying to maintain the product’s identity as software (Itō & Murakami, 2013, p.99).

The design of Hatsune Miku thus targeted two different groups: the *dōjin* culture, and its orientation towards animation characters; and DTM fans, specialists in electronic music and computers.

It is important to emphasise here the difference between the sound produced by the software and the character imagined by the user. As Masuda Satoshi, researcher on popular music and media theory points out, voice and personality are closely related to each other (2008). Only when a personality is assumed does the sound that comes out from the software become a voice. Itō Hiroyuki also draws a clear distinction between the software of Hatsune Miku, which is a product for sale, and the character of Hatsune Miku, which they made openly available for non-commercial use.

The design of the character and the particular voice used in Hatsune Miku give her a personality that stands out from former voice libraries like Meiko or Kaito, also developed by Crypton. However, from the perspective of the advertising department at Crypton, the primary aim of the company was not to create a character or a virtual idol:

The concept was not to create a character. Rather, we produced a clear concept of the product [by focusing on elements like] the voice quality or the character in order to be able to reach more users. Hatsune Miku was the first [product] for which our company planned a strong concept to this degree. [...] [But], after all, Hatsune Miku is software for producing music, so we do not use the definition ‘idol’ (Crypton representative, personal communication, July 31, 2014).

For Crypton, the character is the by-product of the development of software with a clear concept. Moreover, Hatsune Miku has a significant weakness as a character in conventional terms. Fictional characters are usually imagined as the protagonists of a narrative. Their personality comes to be in and through the narration. However, in the case of the Hatsune Miku software, the expression of personality is based mainly on the tone of the voice and on the visual features. Traces of a narrative can be found in her strange name, Hatsune, which in Japanese is written with the kanji for ‘first’ and ‘sound’, and Miku, which has the katakana for one possible reading of the kanji ‘future’. Therefore, the name Hatsune Miku evokes the meaning of ‘the first sound from the future’. There is also a basic profile on the

official Crypton website, with her age, height, weight and favourite music genres. As the representative from Crypton stated:

The virtual singer characters from our company do not have any clear background like personality or birthplace. By omitting a detailed background, we are allowing the users to be freely inspired to create unlimited narratives. I think that it is precisely because of this diversity that the fans can also easily find a work, within a large amount of songs and narratives, with which they can ‘sympathise’. [...] Hatsune Miku was not created to circulate content in the media, but rather [is a] package character for software intended for creators to produce songs. For that reason, we have purposely not included any detailed character background, and the character has been developed to make it easy for users to expand the image and create their own works (Crypton’s representative, personal communication, July 31, 2014).

Crypton’s aim to leave the development of the character in the hands of the software users and its fans led to the creation of content that was used in a similar way to a video game. At the beginning of the Vocaloid movement, when Hatsune Miku went on sale, one important segment of users was junior and senior high school boys. As Nijihara-Peperon-p, one of the creators I interviewed for this research commented, Hatsune Miku was cheap in comparison to the other voice libraries on the market in 2007, and, therefore, affordable for a high school student like him. Many of those boys were fans of ‘cute girl’ video games or animation. Among them, the video game *The Idolmaster* (by Bandai Namco Games) was particularly popular in 2007, and the animation adaptation, *Idolmaster: Xenoglossia* (by Sunrise), aired between April and October, just before the release of Hatsune Miku. Within that context and with the increasing popularity of the Nico Nico Dōga website, the creativity in the network undertook the shape of a kind of game where players can create and produce their own idol and make it famous on internet platforms.

Valuable Resources: The Character, the Tools and the Content

On the 4th of September 2007, five days after the release of Hatsune Miku, the user Otomania uploaded a flash animated video to Nico Nico Dōga called, *I Tried to Sing to Vocaloid 2 Hatsune Miku the ‘Ieva Polka’* (Arimura, 2008). This video was perhaps the first hit for Hatsune Miku. In the promotion video for the song, the software package illustration appears first, but when the song starts, a cute parody of the character of Hatsune Miku appears, moving a leek up and down with her arm. The character parody, drawn by the user Tamago, was later known as Hachune Miku. In fact, the song uploaded by Otomania was a parody of another video, titled *Loituma – Ieva’s Polka*, which was uploaded to Nico Nico Dōga on the 6th of March in 2007 by the user Tororo. In turn, the work by Tororo was a parody of the character Inoue Orihime from the popular TV animation and manga *Bleach*. This earlier video featuring the character from *Bleach* was only one of many videos uploaded by several users

depicting characters singing and moving a leek in circles, with the same background music. This is an example of the collective creations of MAD culture, representative of Nico Nico Dōga at its beginning.

However, the events that followed Otomania uploading the MAD video signalled an important turning point in *dōjin* culture and the content industry in Japan. The elements of Hatsune Miku shaking a leek and the parody character Hachune Miku were incorporated in the official product Nendoroid Hatsune Miku, a figurine or small model of the character that was released in March of 2008, six months after the video was uploaded on the internet. The figurine was produced by the major firm Good Smile Company, Inc., a manufacturer of hobby products, under the official licence of Crypton Future Media, Inc.. Behind the production of this small toy was a transformation in the structure of production and legal frameworks, which allowed the incorporation of amateur content into commercial products. By the end of 2007 and the beginning of 2008, through trial and error, several companies like Dwango (Nico Nico Dōga), Crypton and Kadokawa were developing a new environment of production and consumption. In the case of Vocaloid, such an environment was born from the double nature of the voice libraries as tools and as characters.

For her creators and related industries, Miku is referred to as a character. As the title ‘Character Vocal Series’ and her name make clear, beyond the narrow definition provided by Crypton’s advertising department, she is projected as a fictional character—as an android from the future (see for example the essays published in a special edition of *Eureka [Yuriika]* magazine in 2008). Moreover, the commercial interest in her is usually seen by the industry as part of the character business, in the context of the media mix in Japan. Nonetheless, for her creators as well as for the companies dedicated to producing and commercializing voice libraries for the Vocaloid engine, it has been essential to differentiate between the imaginary character of Hatsune Miku and the software. This differentiation is fundamental because Crypton decided to allow free use of the character in the form of non-profit fan activity.

As authors like Steinberg (2012) or Odagiri (2010) have shown, businesses centred on characters and their branding have been a common feature in the Japanese media market since the beginning of the TV anime industry, like in the case of *Tetsuwan Atomu*. Here, the migration of characters from narrative media like anime or manga to goods without narratives such as toys and candy does not always flow in the same direction. That is, a character may be launched in the market before the establishment of narrative settings, and these settings may be figured out after the character achieves commercial success, such as with the famous case of Hello Kitty (Odagiri, 2010). In any case, the strong personality or charisma of the character is the main driving force behind sales of the product. It is this strong presence that makes possible the appearance of the character in many different media and products, resulting in the so-called media mix, thereby making the character a valuable resource.

From the perspective of the content industry, to give away an important resource—such as a character—for free seems odd. However, this practice not only exists as a means for promotion or advertisement, but has also proved beneficial in sectors such

as the software industry. The Vocaloid scene presents an interesting blend of software and content which, within the spread of media platforms such as Nico Nico, became even more complex.

If a character is understood as content from the perspective of the anime or manga industries, which depend on the licensing system in order to develop a media mix and receive revenues from secondary markets, in the case of Vocaloid libraries, characters are first of all tools or instruments used to produce songs. For Crypton, the character is not content but, as Itō has stated, an interface. Here, it is important to focus on the characteristics of the interface as Itō describes it. From his perspective, “for an interface to be useful, it must be able to be used by anybody” (Itō, 2012, p.478). In other words, once Vocaloid libraries become popular as characters, their voices and the concept of the character become a kind of language ready to be used to express any kind of message, but in this case, using the same voice or character identity. The important point here is that whether it is considered music software or a character, Hatsune Miku is intellectual property.

De-Appropriating Resources Under Character Identity

At the First Nico Nico Scholars Association Beta Symposium in December of 2011 (Itō, 2012), in a session entitled ‘Creating Architectures for Creating’, Itō Hiroyuki described the three main activities of Crypton. One is the importation and development of virtual instruments; Hatsune Miku, which is a virtual instrument, belongs to this category. The second is to provide the system and services of a music aggregator. As he explains it, this means taking the role of an intermediary by providing music files from an artist to each service for downloading, and receiving the profit generated by the downloads from each downloading service to distribute it to the artist (Itō, 2012). The third is to provide and manage web services. There are several types of web services provided by Crypton; two examples are Piapro and Karent. These websites are defined as “CGM (consumer-generated media) style sites for uploading”, and described by Itō as “[services] focused on enabling the uploading of illustrations or the music of Hatsune Miku or other Vocaloid characters by creators, and the sharing of those works to enable their use by other creators” (2012, p.50). The structure that supported the transformation of Hachune Miku, a fan or amateur creation, into official content, is based on these three elements.

When considered as a virtual instrument, Hatsune Miku is Crypton’s merchandise; it is software to be used as a tool. Consequently, as Itō has repeatedly stated, as in the case of any instrument, Crypton is not the rights holder of any of the songs produced by this instrument. However, Hatsune Miku as a character is a creative work; therefore, it is automatically protected by copyright law. For that reason, if Crypton has the basic policy of allowing the free use of the character by any user, it becomes necessary to issue a license.

Therefore, Crypton created a licence called the Piapro Character License (PCL). The aim of this licence, in the words of Itō, was to transform a “principle of NG (not good)” into a “principle of OK” (2012, p.478). Itō asserts, “Copyright law applies automatically to all creative works without taking into account the

creator's will" (2012, p.478). He also explains, "the copyright holder, by determining in advance the range of the authorization to exploit the creative work and making it public, is able to allow use of the creative work within that range by anyone, omitting the steps needed for individual authorizations" (2012, p.478). Crypton, which is the copyright holder of Hatsune Miku, abbreviated the process of issuing individual licences to each creator in order to allow use of the character. By changing their stance to "OK", they allowed the production of many secondary creations, transforming the status of this activity from a copyright infringement to a legal activity.

Crypton issued *Guidelines for Character Use* as early as December 2007, and as Itō relates, "it was the first time that all users became able to produce secondary creations with confidence in a legal manner" (2012, p.480). Furthermore, the Piapro Character Licence was issued in June 2009, allowing the free use of all the characters produced by Crypton whenever their use meets the following conditions: 1) it is for a non-commercial purpose and does not generate profit; 2) it does not violate public order and morality; 3) it does not infringe on the rights of third parties (Itō, 2012). Additionally, in December 2012, as the Crypton website states, "Crypton decided to adapt a 'Creative Commons License CC BY-NC' for the original illustrations of Hatsune Miku to support open creative activities all over the world" (Crypton, n.d., para 1). The company detailed the aims of this stance in the following way:

Our aim was not to facilitate the character business; rather, it was to support the productive activities of the creators. Basically, secondary creations are not allowed without the agreement of the author. However, previously some secondary works were created within an unspoken agreement (a grey zone). To enable creators to produce their secondary creations with confidence, our company developed a licence regarding the use of the characters and decided to allow unrestricted production within that licence. Before us, the number of companies providing such a licence with that aim was limited. Therefore, I think it is possible to say that, in that respect, this was a new way of thinking (Crypton representative, personal communication, July 31, 2014).

Alongside Crypton's approval of unrestricted use of characters, their aggregating services and management of CGM style websites formed the structure that allowed the commercialisation of the creations of users, as with the example of Hachune Miku. It is interesting to note the emphasis from Crypton on not categorising this system as a character business, which is typically an important market in the content industry.

Through the management of licences and the identity of characters, it has also been possible for Crypton to further commercialise Hatsune Miku related content. This commercialisation was an innovative use of user-generated content (UGC) within Japan's character business and the music industry. The multiple uses of UGC for different products featuring Hatsune Miku are a good example of such innovation. Here, it is important to focus on the paradoxical fact that the creative works generated using Hatsune Miku may simultaneously be considered as original

content if Miku is regarded as a tool, but may also be described as secondary or derivative creations, if considered as use of the character. Hence, an understanding of the difference between tool and character is essential.

As in the example of the parody character Hachune Miku and the leek, the creativity rooted in the *dōjin* productivity behind MAD culture or in many creations on the internet is not generated by a single person's efforts. The practices of appropriation, which have been largely documented by fan studies, may be regarded as the collective construction of a stock of cultural resources. This content is, therefore, at the same time intellectual property and the shared resources of a particular collectivity. As such, we can understand this system—which allows creative collaboration between amateur users and industrial actors—as a marriage between commercial practices, based on creativity and the intellectual property of the content, and non-commercial practices, based on play and the idea of content as a cultural resource. This marriage has proven to be as conflictive as it is productive.

The role of CGM is central in this structure. In the case of Crypton, there are the examples of Piapro and Karent. Piapro was launched in December 2007, at the same time as the issuing of the *Guidelines for Character Use* mentioned above. It is a website where it is possible to upload music, illustrations, texts or 3D models. Its particular feature is that the uploader must be the creator of such content and must agree to the use of the uploaded content by a third party as a resource for producing new work. For that reason, the website has adopted the Creative Commons (CC) licence system. Therefore, it becomes possible to create various secondary works on the basis of an explicit agreement among the creators. This method of collective creation is usually called 'collaboration' in the Vocaloid scene, although most of the time it lacks the mutual commitment and communication between collaborators that a collective work usually entails.

The works that are created by using material available on the Piapro website usually take the form of a short video which can be shared on Nico Nico Dōga. The website allows content to be linked between both websites. As the website states, Piapro provides a "place for creators to make new content" (Piapro, n.d, para. 1). It is therefore an environment that supports what Hamano has called chains of creativity or Nth creations (2008, 2012). In addition, in 2008 the website Karent was launched as a record label that aimed to support, and be supported by, artists (Karent, n.d.). The users who upload content to this website can manage it by themselves, and can put their creations on sale using several downloading services such as the iTunes Store, Amazon MP3 and the Japanese Tsutaya DISCAS.

What were the motivations behind Crypton's encouragement of the free use of the character of Hatsune Miku? Similar to Kenmochi, Itō says he felt surprised when "the dynamic movement of so-called secondary creations" started soon after the release of Hatsune Miku, (Itō & Murakami, 2013, p.99). As he explains, "I thought, we will have to do something so this chain of creativity does not stop [...] we are Miku's protectors" (Itō & Murakami, 2013, p.99). Among the works focused on Hatsune Miku as a subject, there were not only songs, the output of the software, but also illustrations, various kinds of animation, co-

splay, amateur dancing or *odotte-mita* (lit. I tried to dance), and amateur singing or *utatte-mita* (lit. I tried to sing), most of them uploaded as videos to the internet. As Itō states, “It formed a kind of cultural space, and Miku became a platform for creation” (2012, p.50).

After the unexpected success of Hatsune Miku, Crypton decided to allow free use of the character because as a small company they didn’t have the resources to respond to fan requests for permission for use. However, the system of management and the stance towards the intellectual property of the character that Crypton later adopted and refined was able to protect and foster the dynamism of creativity. This stance opened up new possibilities for *dōjin* productivity and for the development of new services in relation to those activities, linking industrial actors and consumers in a way that was seen as revolutionary by the end of 2010. Their stance towards the open use of the intellectual property of the character and the emphasis on the software as a creation tool became standard in the Vocaloid scene. Internet, Co., Ltd., the second company in Japan that began to produce voice libraries for Vocaloid, provides an example of how this position was adopted by others.

Internet Co., Ltd., debuted in the Vocaloid scene with the popular voice library and character Gackpoid (July 2008) followed by Megpoid (June 2009). These characters are among the most famous voices libraries and characters they have produced. Murakami Noboru, the president of the company, explains their position on the use of the characters as follows:

We are not doing it as a character business. So, if it is about the use of the character for a commercial purpose, of course we issue a licence. However, Vocaloid itself is basically voice synthesiser software, so we regard it as an instrument, which is not a character good, right? We only added the character originally just to make easier to understand who is singing (Murakami Noboru, personal communication, April 4, 2014).

The stance of Crypton and Internet Co., Ltd. is clear. They are software companies and their focus is not on producing content, but rather on selling the software, or in any case, the environment of services and software. Unlike the content industry, they regard their customers as users and not as audiences. Therefore, they were able to conceive and build a system that enabled de-appropriation of the resource of the character, based on its free use, in a way that, in the content industry, may be regarded as an act of suicide, given the dependence on character licences.

Re-appropriating Resources: The Profitability of Participation

A large amount of songs and content related to Vocaloid may be considered original from an intellectual property perspective, but the collaborative process of production emphasizes the social nature of creation. The reluctance of many participants of the scene to call themselves creators or to claim authorship is an acknowledgment of this process. In Japan, after the success of Hatsune Miku, content has mostly been released on Nico Nico Dōga, Piapro and in recent years on YouTube as well. In the case

of Nico Nico Dōga and Piapro, it is generally the original creator who puts the content into circulation among the internet community under his/her own pen name. This user-generated content is recognised as the original creation of each user and at the same time, as Miku’s performance.

Along with the creation of songs, many users appropriate the iconic design of Miku and generate new images or videos. The website and internet community Pixiv has been an important forum for these graphic productions. Besides illustrations or videos, Mikus’s fans also generate story-based content like amateur comics or novels or, in some cases, animation. This content is distributed among fan markets through many websites and fan-built media and fan networks, which like Comic Market or fan stores, are not always limited to the internet.

It is important to note that the free appropriation of Miku’s character in many different fan productions is, in the majority of the cases, independent from Crypton’s control. Creators also freely choose the channels through which to distribute their creations. Therefore, the networks that are developed (like the activities on Nico Nico Dōga or Pixiv) are also beyond any Crypton management. Thus, although beyond its management, Crypton encourages the fan appropriation of Miku as a fictional character.

Yet, Crypton also exerts its own direct management of Miku. This management has three general courses: 1) the management of fan-creators’ creative activities and content; 2) the management of licences and the use of Miku by other companies with a commercial interest; 3) the management of a mix of both of the above. The website Piapro and its special PCL system, as well as the official “39ch Hatsune Miku Official Channel” on YouTube, the Facebook Hatsune Miku official account, and the official community of Hatsune Miku on the site mikubook.com are platforms owned by the company that play an important role in this management.

In the first category of management practices, we can focus on the encouraging role of Crypton towards the non-profit creation of user-generated content, related to the understanding of Miku either as a voice or as a visual icon. Here, the adoption of the CC licence system for illustrations of Miku and the PCL system for the content uploaded on Crypton’s Piapro website is fundamental. The role of other websites and services in adopting these policies, although beyond Crypton’s management, is also central.

An example of the success of this management was the rapid increase in Miku’s popularity around 2014, along with the rise of many popular creators. They, in their role as Miku’s producers, are central actors who shape the body of Miku and give life to her as a truly public good.

In the second category, we can find the direct licencing activity executed by Crypton, enabling the creation of content by other companies. Some examples include the creation by the Good Smile Company of licenced products, like figurines or toys that use the image of Miku; as well as some publicity campaigns or official merchandising with content produced for commercial use. In these cases, other companies obtain the licences to generate profit-making content using Miku’s image.

The third category is perhaps the most important and distinctive in this model because of the lack of original content in the character designed by Crypton. In this category, we can

find a mixture of user-generated content distributed by various consumer-generated media and later commercialised by other industries as profit-making goods or services. This is where fan communities and their productive cultures meet the profit-making structure of content industries and their markets, and where creativity and new use-values become exchange-values driving the development of new markets. The content generated by the users is commercialised by a third company under the licence of Crypton, and the creator is invited to participate as an official collaborator. The most famous example here is the video game series *Project Diva* supported by SEGA. In this game, songs composed by users that gained popularity in internet communities are performed as part of the game by a 3D computer graphics design of Miku, who sings and dances in the game (alongside other characters from the CV series). The songs and the 3D CG Miku are also used to perform live concerts and the songs are also released on albums as song collections by Sony Music Direct (Japan) Inc. This way of managing Miku makes this model different from the standard character business model.

Finally, as part of the third category of management practices, there are also users who have become professional producers through the use of Miku, releasing their content through large companies like SEGA, Sony Music and Victor Entertainment. They occupy a space at the intersection of Crypton's Miku, user-generated content, and big media companies. Two examples of this kind of user are the producer ryo who leads the J-pop music group Supercell, and the producer kz (livetune) whose song "Tell Your World" is used as background music in a Google Chrome commercial. These two creators, as well as many others, have benefited from the technical characteristics of Miku as a tool and from its horizontal and consumer-based business model.

Conclusions

The Vocaloid scene represents the linkage of different groups and institutions in a relatively open network. Key among these groups are the industrial actors, who have an open and market-centred orientation, and *dōjin* cultures, who have a rather closed and community-based orientation.

The general overview of the Vocaloid scene I provided in this paper focused on the industrial actors, mostly Crypton, and the framework they developed based on the double nature of Vocaloid voice libraries as tools and as characters, or in other words, as software or platforms and as content. In particular, the strong identity of the voice library Hatsune Miku generated a framework that enabled the integration of the practices of *dōjin* cultures with the content industry practice of media mix or character business, through a system of de-appropriation and re-appropriation of the same media resource.

One of the innovative aspects of Hatsune Miku that encouraged such a boom of productivity was her lack of a precise background narrative alongside a strong identity, a feature derived from her double nature as a tool and as a character. This identity was, from her creation, expressed through her voice and her image, which were carefully designed to stand between two branches of amateur culture that were not directly related before: amateur electronic music (DTM) and *dōjin bishōjo* culture. Hatsune Miku was the hub that made possible such a

cultural crossroad, while Nico Nico Dōga provided the perfect environment for growth and propagation. Hence, Hatsune Miku was not a character without background, as commonly argued; her background and her world were the various cultural streams that converged into her apparent lack of content. With such a huge world on her back, and through a variety of texts such as songs, illustrations, cosplay pictures and music videos, the existence of Hatsune Miku as a fictional character has become the true embodiment of a collective creation. Therefore, it was the double nature of Hatsune Miku as a tool and as a character that made possible a structure that allowed the free use of her iconic presence within a unified yet heterogeneous productive system.

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