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Is the YouTube animation algorithm friendly?

How YouTube's algorithm influences the evolution of animation production on Internet.

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Abstract

YouTube has become a great showcase for audiovisual products and a source of income for a number of creators. Several pioneers of Internet animation migrated to this platform to provide greater visibility and economic security for their productions. A group of YouTubers, so-called 'Reply Girls', achieved rapid economic benefits by publishing content without any value, neither artistic nor communicative, but that deceived YouTube's remuneration system and prioritization algorithm. To fight this phenomenon, YouTube subsequently applied changes to its prioritization algorithm and monetization plans. In this article, we examine more than 3300 videos published by 25 animation channels between 2006 and 2018 with Digital Methods tools to analyse how the changes applied to the platform policies have influenced and shaped the evolution of animation production on Internet.

Keywords

YouTube, Reply Girls, prioritization algorithm, Digital Methods, digital animation, streamponks, transcoding

Introduction

Animations for the Internet traditionally do not have to face the restrictions of commercial circuits and are conceived from a place of absolute creative freedom; they often differ from more commercial productions in subject matter, treatment, duration, and technique. Recent digital tools have allowed the emergence of new independent animation creators, who can produce and disseminate their work outside of conventional production systems and commercial distribution circuits. Many new animators have found the Internet, and especially the YouTube video platform, a vital channel to showcase their work to a large potential audience and, in addition, to obtain a certain economic benefit provided by the platform. These online animated works can be distinguished from those produced by the global animation industry in two ways: their artisanal character and relationship to discourses of craft, and their themes, which are typically aimed at a non-child, more adult audience. These characteristics have progressively been lost due to animation's broader industrialization and submission to social and market laws. If the socio-economic conditions have forced the animation industry to adapt, new animators are subject to the specific conditions imposed by the platform: the conditions of use and, above all, the characteristics required to prioritize and recommend content. These restrictions oblige that new creators bend to the criteria set by YouTube in order to maintain their viewing rates and also benefit from economic returns.

Specifically, the changes in YouTube algorithm and the new monetization conditions do not prioritise animation productions. So, we could say YouTube is no longer "animation-friendly". Some animators have had to adapt their creations in order to be well valued by the platform. The main purpose of this article is to analyse how the channels of a cross-section of Internet animators have been adapting their production to the new monetization conditions of YouTube. Our interest in this topic is that we believe the process of adaptation to the medium to optimize production resources has led to innovative proposals, such as anime parodies, machinima animations, comic book dubbing and animated vlogs, as

well as a shift towards limited animation techniques and minimalist design in stroke and colour. We understand that animated videos published on YouTube are part of the collection of digital cultural objects, and that they are subject to the influence of the phenomenon that Lev Manovich calls 'Transcoding', that is, the interrelationship established in new media between the 'computer layer' and the 'cultural layer' (2001: 46). Our intention is to demonstrate that a 'transcoding' process has been experienced in a number of YouTube animation examples, caused by the modification of technical requirements by the platform which, in turn, had been themselves modified in response to the behavior of some users. We believe that the change in the platform's recommender system, a purely technological issue, has indirectly led to the appearance of new formats and even renewed aesthetic trends. The data will confirm if this change, like a butterfly effect, has affected the artistic manifestations of the YouTube animators, and whether, as Manovich (2001) would say, the technological layer has really transformed the cultural layer.

This article therefore builds on the principles of Richard Roger (2013, 21), who states that 'the issue no longer is how much of society and culture is online, but rather how to diagnose cultural change and societal conditions by means of the Internet. The conceptual point of departure is the recognition that the Internet is not only an object of study but also a source'. Digital objects, such as a digital animation videos viewable on YouTube, are no longer an isolated, virtual and differentiated part of our cultural reality; therefore, we inscribe this research along the lines of what Roger calls Digital Methods. The methodological approach of Digital Methods is that both the content published on the web, and the trace that users leave when producing and consuming that content, are equally a source of data to understand social-cultural phenomena and behavior that are manifested on the web. With an approach rooted in Digital Methods, 'we look at Google results and see society, instead of Google' (Roger, 2013:17). In our specific case, we intend to determine how YouTube animation productions have adapted to these kinds

of approaches, analyzing data obtained directly from YouTube itself not to understand the platform, but the culture that uses it.

The purpose of this work is ultimately not to make an exhaustive content analysis of the productions studied, but to use the Digital Methods tools to produce observations regarding the contents that will allow us to relate such data and infer qualitative aspects, such as the changes produced in the themes treated by the filmmakers, or in the type of audience to which the productions are directed.

Digital Methods and animation channels on YouTube

To obtain the analysis sample, we used the tools 'YouTube Data Tools v1.10' created by Bernhard Riederer (2015)¹. These tools use YouTube's V3 API to display the information of a channel from its channel id². This approach allowed us to compile the metadata for all videos published from each of the 25 animation channels selected from 2006 until 21 and 22 May 2019, the dates on which the sample was taken. We have title, channel, description, category, publishing date, length, counts of views, likes, dislikes and comments for each of the 3699 videos, as well as the number of subscribers to each channel. With these 'YouTube Data Tools v1.10' we made sure that we had all the information generated from the day that the different animations were first published, until the date the data was collected. In addition to the integrity of the information, the tool facilitated the automated mining of the data stored in YouTube. If the sample had been obtained manually, we could not have worked with such a large volume of channels and videos, compromising the reliability of the results.

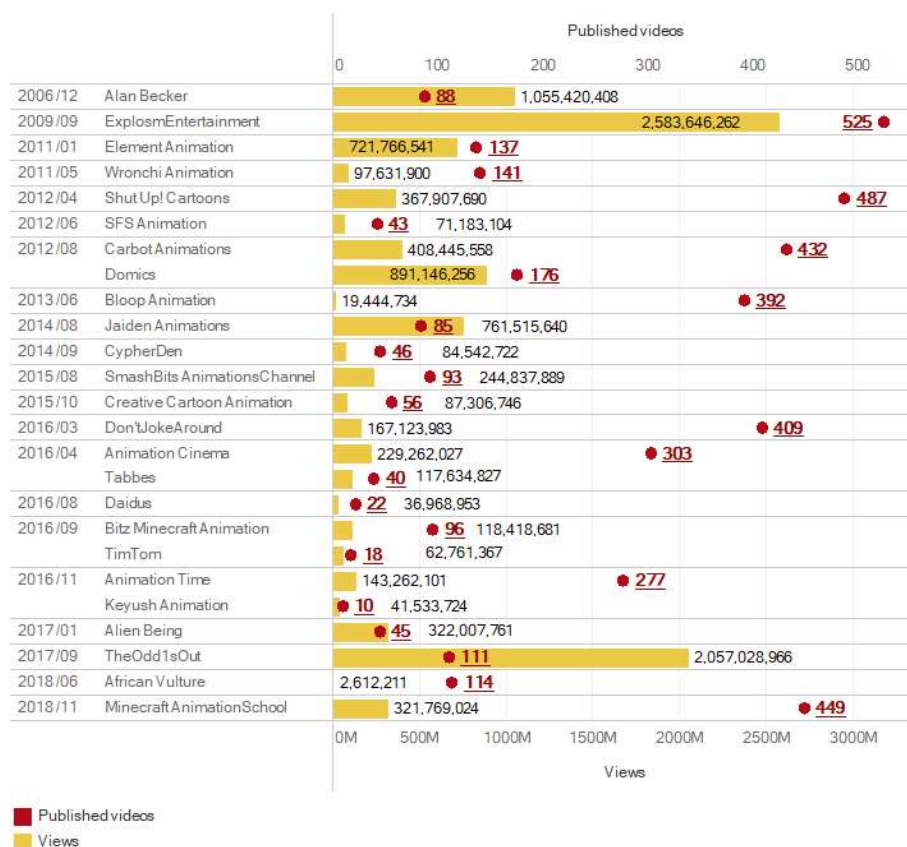
All the data collected with 'YouTube data Tools' was saved and then managed jointly using two books from the Tableau data visualization program. Following the principles of Open Data, the data collected has been made available to the public so that they can be used, reused and redistributed freely, with the attribution of authorship being enough³. In this way, the results of this work can be validated, while other

aspects can be extracted from the analysis of this data and examined in greater depth. With this software we combine the versatility of a spreadsheet with the facility to visually represent the information. The intention was to be able to detect patterns and trends in the evolution of the production of animations published on YouTube, and to check whether these trends were altered after 2012, when YouTube approved changes to its recommendation algorithm. The 25 animation channels were selected by considering the list published by feedspot⁴ on 26 February 2019. From this ranking, which lists a total of 100 YouTube channels dedicated to animation, the first 25 animation channels that had videos of their own production on the sampling day were taken. In addition, those that belonged to large corporations were discarded⁵. Since 2019 was not yet complete, a decision was made not to include in the analysis any of the videos published that year. Once the 2019 animations were excluded, 3376 analysis units were obtained that corresponded to all of the videos uploaded between 2006 and 2018 in the 25 selected channels. With the information obtained, we were able to address the analysis of the possible changes that occurred during this period relative to the number of publications, their duration and the publication rate. The selected channels are observed in Figure 1, sorted according to the publication date of the first video on the channel.

The 3376 videos published by the 25 channels add up to a total of 8,822,179,453 views from the day of its publication until the sampling day. The oldest channel in the sample (produced by Alan Baker) uploaded its first video in December 2006, and the channel with the most recent creation (Minecraft Animation School) uploaded its first animation in November 2018 – almost 12 years later. Older channels have had more time to produce content, and given the longer exposure time of their animations, it is also possible for older channels accumulate a larger number of views. However, the creative rhythms of the different animators are very different. As we will discuss, certain types of animation production are less demanding and others more labour intensive. The time spent on a machinima work (in which are used real-time

computer graphics engines to create the cinematic production, usually from video games) is, for example, much less than that required to create a vector animation (in which the animator draws, inks, animates and sounds the production himself). It is also generally quicker to produce content that is not strictly animation, such as tutorials, product reviews, life drawings or 'Question & Answer' videos. For this reason, Minecraft Animation School, the most recent channel studied, with a collection of 449 videos, occupies the third position in terms of productivity. This channel produces and publishes between two and three daily Minecraft machinimas on average. A channel that works at a slower pace is Keyush Animation, which publishes a 3D animation approximately every 3 months (See Figure 1).

(Figure 1 HERE)



More, longer but less animation: towards new genres

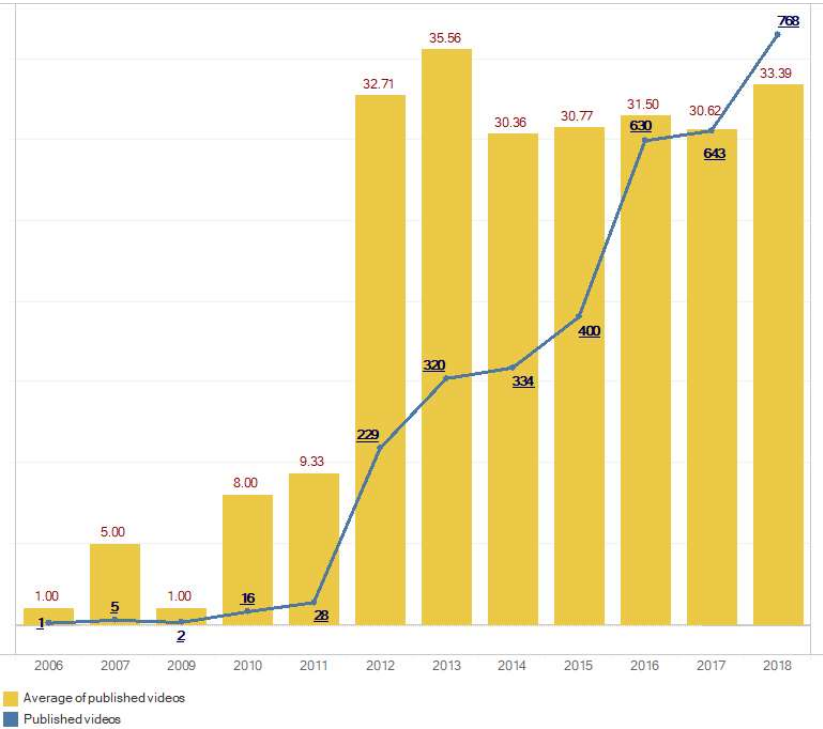
The YouTube platform was officially launched on 14 February 2005 and was acquired by Google in 2006. The platform implemented a business model based on advertising, and since then part of the revenue collected by YouTube is intended to reward the creators who provide the audiovisual material to which the advertising messages that the platform exhibits are attached. The monetization model of YouTube is called 'Partners Programme'. The conditions and amounts received are imposed by YouTube unilaterally, though have changed over time. To request entry into the programme, a user must meet certain conditions or criteria. Among certain requirements, the channel is required to accumulate more than 4000 hours of viewing in preceding last 12 months, and have more than 1000 subscribers (YouTube, 2019c). Programme income can come from five different channels: Advertising revenue, channel memberships, merchandise shelf, superchat or YouTube Premium revenue (YouTube, 2019a). Advertising revenue is the most obvious and direct form of benefit. Under this form of commercial exploitation, YouTube offers six different formats to its advertisers: Display ads, overlay ads, skippable video ads, non-skippable video ads, bumper ads and sponsored cards⁶ (YouTube, 2019b).

In 2005, certain platforms already existed that allowed animators to share their creations. One of the reference platforms for the animators was Newgrounds (www.newgrounds.com), which since 1995 brought together content created using the vector programme Flash, whether animations or games, as well as drawings, music or texts. On this platform, which still operates, Web animator pioneers were in contact and shared their creations. In addition, starting in 2010, YouTube – unlike other existing platforms – proposed a way to remunerate creators for published content. The young animators of Newgrounds saw YouTube as a way to monetize their productions and publicize their works globally. Thus, under a payment-for-visits volume proposal, Newgrounds animators began to migrate to the new YouTube

platform. The independent digital animators, who until now had not received any financial compensation for publishing their creations, began charging for the works distributed on YouTube.

To check whether the published videos are adapted to YouTube demands, we analysed the evolution of the volume of publications. During 2012, YouTube proposed changes to the prioritization algorithm (Moz: 1). Just that year, a change was detected in the pace of video publications, and an increase in the number of channels published. These figures went from 28 videos produced by three channels in 2011 to 229 videos created by seven channels in 2012. The production volume of each channel, as shown in Figure 2, increased from an average of 9.33 videos per channel in 2011 to 32.71 per channel in 2018. This average, greater than 30 videos per channel per year, has been maintained since 2012 (see Figure 2).

(Figure 2 HERE)



In studied channels, animations shared on YouTube between 2010 and 2011 had average more than 8 million views by 2018. Creators therefore obtained good economic profitability from their publications on YouTube. Kevin Yen, Director of YouTube Strategic Partnerships, said 'YouTube's potential as a monetization platform is unparalleled, and we are in just the nascent stages. The fundamental factors that drive monetization are the number of playbacks and the money earned per playback' (cited in Ulin: 2010, 338). However, in 2012, YouTube changed its retribution system to minimize the impact of the so-called 'Reply Girls'.

At that time, those responsible for YouTube intended to generate *engagement* with the content, promoting users' responses. As the platform distributed videographic content, it was considered opportune to value the interactions in video form above any other. In other words, YouTube decided to give more visibility to the interventions made by the followers of a channel in the forum if they were video responses, highlighting them over the usual textual responses. For this reason, YouTube's homepage was re-designed: on the right part of the screen, a vertical band was reserved for videos that received the most visits. In this privileged area, videos recorded in response to these featured videos were also included. Some Internet users, eager for popularity, realized that it was enough to record a video in response to one of the videos with the maximum audience to appear on the list of recommendations that YouTube made on its home page. In addition, appearing on the home page ensured a large number of hits that could eventually become views and subscribers. In other words, a significant number of visits could be obtained by posting videos in response to the most popular content.

In November 2011, this strategy caused the so-called 'Reply Girls' to appear. Taking advantage of the characteristics of the new content prioritization algorithm, "the Reply Girls had found a way of exploiting the recommendation algorithm by employing various engine optimization tactics to drive traffic to their

videos” (Bucher: 2018, 128). Internet users such as Megan Lee Heart and Alejandra Gaitan managed to reach privileged places on the YouTube home page by posting an average of five response videos per day – always linked to very popular publications. Their videos were very brief. In addition, these users recorded their messages while exhibiting a more directly sexualized image, which was also shown in the thumbnail presentation of the video itself and operated as a form of clickbait. Although these videos received numerous ‘dislikes’ and disapproval messages, and a number of users abandoned the video before it completed, the YouTube algorithm positively rated both the volume of visits to the video and the number of comments in protest. As Bucher argues (2018, 128) ‘to the agony of the many YouTubers who continued to down-vote the cleavage-baring videos, the Reply Girls only seemed to become even more prevalent as part of the related video section’. Following the established retribution model that was based on the number of views and *engagement*, YouTube paid its creators high sums of money for content that was very easy and fast to produce, of very low quality, and that lacked any value for users. This is in opposition to the producing of animated content, which are typically slow, long, laborious and expensive. The only thing that the animations on YouTube had in common with the ‘Reply Girls’ productions was brevity.

Previously, new players had appeared in the online video market. Hulu or Netflix were presented as emerging platforms that could threaten the hegemony of YouTube or, at least, reduce its turnover. At that moment, ‘the online video revolution was unleashed and whether a new entrant (e.g., YouTube, Hulu) or market leader (e.g., Amazon, Netflix) all companies were experimenting with business models that could tap into’ (Ulin, 2010: 294). In 2009, Hulu announced deals with MGM, Paramount and Universal and YouTube with Lionsgate and Sony (Ulin, 2010). As a result, providing low-quality content was not beneficial to YouTube, and so YouTube labelled the ‘Reply Girls’ as spam in February 2012, and announced significant changes in the recommendation and retribution model in March 2012, not based in clicks only.

YouTube's team stated that 'this system serves videos based on the number of clicks they receive, which would be like suggesting a TV show based on how many people briefly flipped on a channel while surfing. But clicks aren't always the best way to predict whether you'll be interested in a video' (YouTube, 2012a). Referring to the provocative thumbnails of the Reply Girls, the text continued 'sometimes thumbnails don't paint the whole picture, or a video title isn't descriptive' (YouTube, 2012a). Finally, the company confirmed that had been 'experimenting with the way we offer Related and Recommended videos, focusing on video engagement to get people to the videos they like more quickly' (YouTube, 2012a), and that time watched would be considered as one of the best indicators of a viewer's engagement. Instead of highlighting content by the number of clicks or responses in the form of a video, videos that managed to retain the user for more time would be recommended. These changes were finally consolidated in December 2012 (YouTube, 2012b). In addition, to be monetized, the videos had to have a minimum duration of 1 minute. The changes in the prioritization algorithm eliminated the 'Reply Girls' but seriously damaged other types of audiovisual products, such as special effects videos, short comedy genres and, of course, animations. In other words, relegated to the background were more complex and time-consuming productions, those of short duration that were perhaps also laborious to produce. As Tarleton Gillespie argues (2010: 353), 'the business of being a cultural intermediary is a complex and fragile one, oriented as it is to at least three constituencies: end users, advertisers and professional content producers. This is where the discursive work is most vital. Intermediaries like YouTube must present themselves strategically to each of these audiences, carve out a role and a set of expectations that is acceptable to each and also serves their own financial interests, while resolving or at least eliding the contradictions between them'. In this case, YouTube watched over the wellbeing of the users and simultaneously sought ways to benefit advertisers but forgot some of the professionals who produced content: the animators.

Clearly, YouTube prioritizations influence the uses and behaviours of both users and creators, which, in turn, influence the evolution of the algorithm. The 'Reply Girls' represented an illustrative example of what can be understood as a transcoding phenomenon. Bernhard Rieder et al. (2018: 53) state that 'on the one side, users react to rankings in various ways, by clicking, watching and – in the case of content creators – adjusting their strategies to what is considered effective at a given moment. On the other side, algorithmic techniques increasingly espouse a probabilistic and experimental outlook where parameters are constantly tested against a desired outcome and adapted according to user behaviour'. Therefore, the phenomenon of transcoding between users and the platform is dynamic and constant.

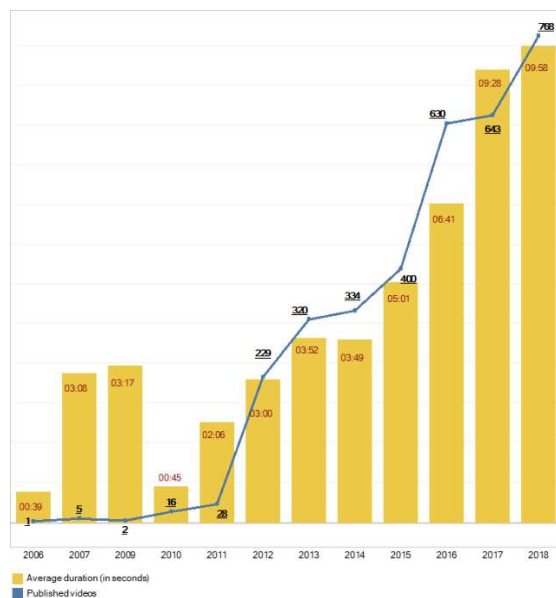
Although YouTube does not make public the variables involved in its algorithm, we know that it is extremely complex, and that it uses artificial intelligence techniques to work as a Deep Neural Network. This is understandable since the system must manage a database that faces three major challenges: the enormous amount of information, the constant addition of new videos, and the difficulty of predicting user behaviour in the face of so many options (Covington et al., 2016). To reveal the secret, how the YouTube algorithm works, it must be reverse engineered. Eilam explains that 'Reverse engineering is the process of extracting the knowledge or design blueprints from anything man-made (...) Is usually conducted to obtain missing knowledge, ideas, and design philosophy when such information is unavailable. In some cases, the information is owned by someone who isn't willing to share them' (2005:3-4). To be precise we must say that YouTube works with different algorithms (Recommended, Suggested, Related, Search, MetaScore). But in this article, we will refer to the different algorithms as if they were one. The reason is that, for the purposes of this research, what interests us is that, since 2012, they all have a common basis: they are governed by the concept of 'Time Watch' instead of simply counting the number of clicks.

As explained by Gielen and Rossen (2016), the 'Time Watch' variable does not simply measure the time a user spends watching the contents of a video: it is a combination of variables (Views, View Duration, Session Starts, Upload Frequency, Session Duration and Session Ends). To take advantage of the algorithm's characteristics, Matt Gielen (2017) proposes publishing videos with a duration of between 10 and 13 minutes online because they are better rated by the system. He adds that publishing regularly is highly recommended, preferably one video every day. In fact, Aaron Smith et al. (2018: 4) confirms that the YouTube algorithm presents long videos on its initial page, with an average duration of 9.31 minutes. Of the list of featured videos, the first position is occupied by videos that exceed 12 minutes on average. The duration increases until reaching an average of 15 minutes for the fourth recommendation. Another conclusion is that the popularity of a video – the number of visits – influences the recommendations proposed by the platform. Another interesting aspect is the evidence that the more time the user spends on YouTube, the greater the duration of the suggested videos. According to Alexis C. Madrigal (2018: 1), 'these conditions were almost certainly not hard coded into the algorithmic decision making. Like most of the Google sister companies, YouTube uses deep-learning neural networks, a kind of software that retunes its outputs based on the data fed into it. It's not that a YouTube engineer said, 'Show people kids' videos that are progressively longer and more popular,' but rather that the system statistically deduced that this would optimize along all the dimensions YouTube desires'.

Obviously, these circumstances do not favour the prioritization of animation channels because it is unfeasible for an independent creator to produce animations on a daily and long-term basis (Lauer, 2014). As these animators' videos do not appear on the YouTube home page, their channels' visibility is also affected. In this way, increasing popularity ratings, gaining new followers, obtaining higher viewing rates and, ultimately, maintaining revenue are also difficult.

Given that the remuneration obtained from YouTube has declined, animators have increasingly resorted to complementary funding channels, such as the sale of merchandising products, subscriptions to online training courses for animators, or sponsorship through Patreon profiles. However, Internet animators have not given up on YouTube: some animators complement their animation work for YouTube with channels in which they present or comment on Gameplays, that is, recordings of live video game sessions. Many have also adapted the duration of their videos to the criteria of the platform as well. In this regard, the analysed channels show a clear increase in the average duration (see Figure 3). Since 2010, the average production duration of animated videos has increased from 45 seconds in 2010 to almost 10 minutes in 2018. In 2012, the annual production was 229 videos, with an average duration of 3 minutes, whereas 768 videos were published in 2018, with an average duration of almost 10 minutes (9 minutes 58 seconds, to be exact). Additionally, since 2012, we have found the first videos that exceed 10 minutes. In 2015, the first videos lasting more than 30 minutes were produced (See Figure 3).

(Figure 3 HERE)



The condition imposed by YouTube since 2014 of monetizing only those videos longer than 1 minute in length could be the cause of the decline detected from that year of videos shorter than 60 seconds long: from 45 videos in 2014 down to 42 (2015), 44 (2016), 32 (2017) and 24 (2018). As the absolute number of publications has increased, the percentage decline has been considerable: from 13.47% of videos shorter than 1 minute long in 2014 to 3.13% detected in 2018 (see Figure 4).

(Figure 4 HERE)



In order to increase the length of their videos, animators needed to be able to produce more content in less time. To achieve this, the strategies adopted by the YouTube animation channels have essentially been threefold: reducing the complexity of their works, creating limited animation pieces in terms of their visual style, and, paradoxically, producing content about animation but without animation. The first two aspects, that of complexity and limitation of animation, are related. As this study has found, the animation productions for YouTube have resorted to the techniques of limited animation, typical of the Hollywood

animation of the 1950s. To reduce the complexity of the productions, the character design in this work has been simplified, basing the style them on simple figures. Colouring has also been limited to the use of flat colours, eliminating shadows and gradients or, directly, designing characters only outlined and without filling. On the other hand, the backgrounds in YouTube animation have become minimalist, drawn with simple strokes, with color spots or, simply, they have been removed entirely. Although the simplification of character design through a more limited animation approach reduces the quality of YouTube animation, it has also led to the emergence of new formats and styles in the world of animation.

The third strategy detected, as mentioned above, is the production of what can be understood as meta-animation videos. Some of these videos are of the type How To, Life Drawing or tutorial videos, in which an animator shows in real time how they draw comics or animations, and explains precise technical details or practical solutions applied to production to personal sensations at the time of the drawing. These are ways of making the time invested in producing an animation profitable, turning the same activity of drawing and animating into a long-lasting audiovisual product. In addition, we also find several Question & Answer videos, in which questions are answered by followers, or even reviews or unboxing of products, in which the animator opens the box of a product and shares with the viewers the sensations of seeing the product for the first time and comments on the contents of the package. This type of content, which is not animation at all, is obviously easier to create than conventional animation, and increases the average duration of the videos published.

In addition to the meta-animation products, we have found new forms of narrative that are transformed into renewed genres. The aesthetics of limited animation have inspired a new genre, Anime Parody. This type of animation is about imagining what a story would have looked like if it had been produced following the patterns and stereotypes of anime. As we have been able found out, 'The SpongeBob SquarePants

Anime'⁷ (2017) by Narmak inaugurated this genre, though other relevant examples of Anime Parodies are those produced by the user Malec, with animations such as 'What if Game of Thrones was an anime'⁸ (2017). Another genre that has allowed the increase of animation production is the Animated Vlog. As in a videoblog, an animated character talks about a topic or a situation he has lived through. The first Animated Vlog is attributed to Domics with its 'Rural'⁹ (2012). Other animators, like Jaiden Animations, Tabbes, TheOdd1sOut, CypherDen or Let Me Explain Studios, have produced Animated Vlogs. Other popular animated media include productions known as Comic Book Dubbing, in which a series of images are shown. These images, eminently static, make up a storyboard or a very simple animatic that the animator sounds with little more than his voice.

The other tool that has facilitated the increase of the duration of the pieces of the animation channels on YouTube has been the production of Machinima animations. Machinima is the use of real-time computer graphics engines to create a cinematic production and it is considered to be 'an example of emergent play, as a new form of real-time animation, and as an art form in itself' (Lowood and Nitsche: 2011, viii). Some video games, such as The Sims or Minecraft, have been used to create animated productions. Channels such as Alien Being or Minecraft Produced publish exclusively animations in machinima.

Author animation and creative constraints

YouTube animators have shown great flexibility in adapting their productions to the requirements of the YouTube recommendation system. Surely, the key factor that facilitates such adaptation is the artisanal, individual, and personal nature of their work. Early animation at the turn of the twentieth century was also artisanal and artistic, but it soon passed 'from early independent animators-cum-inventors to the next phase in which *business* of animation begins to take shape' (Stabile & Harrison, 2003: 3). Animation quickly built processes adapted to the film business, and an animation studio system began to form. John

Randolph Bray and Raoul Barré each created an animation studio in the New York City area as early as 1914 (Furniss, 2017). The consolidation of the animation industry in the United States was achieved in the 1920s, characterized by the existence of courses for training as an animator, the incorporation of cels into production routines, and the definition of a common style for drawn animation. Winsor McCay was disenchanted with the transition from the artistic to the commercial, arguing that 'Animation should be an art, that is how I conceived it. But as I see what you fellows have done with it is make it into a trade... not an art but a trade... bad luck' (quoted in Bendazzi, 2003: 19). But 'by increasing the speed of output, animation studios were able to offer commercially viable products within the live-action-dominated film industry' (Furniss, 2017: 43). Animation was leaving behind a stage of craftsmanship, of experimentation and of personal authorship. In addition, technical elements were incorporated and developed, which allowed improvements to the productive performance of the studios and served to generate products in line with the advances experienced by the film industry, such as the incorporation of sound or, subsequently, the use of colour. Thus, animation reached the status of a cultural industry. These same structures of animation, reinforced and with adaptations, would serve years later to supply the demand of animation as it moved from television and the digital environment. Obviously, in parallel with the development of the animation industry, several animators, like McCay, decided to work with their backs against the commercial machinery. Masterpieces such as those produced by Mary Ellen Bute, Michael Dudok de Wit, Mischa Kamp, Caroline, Leaf, Norman McLaren, Alexandr Petrov, Bill Plympton or Joanna Quinn to name but a few, are an excellent example of this artisanal animation, alien or separate to the industry, and with a marked personal character that has continued to develop outside the mainstream. However, the digital period – in addition to serving the commercial and production channels – has provided tools that once again allow personal animations to be produced easily and prolifically, expanding again the artisan and artistic spirit to animation that McCay felt was progressively missing.

The computer systems, which first served to automate some processes and reduce production times, over time became integral animation systems. Digital modelling tools (such as Maya or Blender), animation assistants (such as DigiCell FlipBook or Marionette), project management programmes (such as SmartSheet) or automated painting modules, were therefore used in service of the industrial model that began in the cinematic epoch, which was reinforced in the later televisual era. However, 'digital animation technologies, like most technologies, are quite ambivalent in their effects, and it is dangerous to make the claim either that they inevitably culminate in elitism in production, or are inherently democratizing' (Crawford, 2003: 124). The fact is that digital tools have once again allowed a single animator to create his or her own content individually, and to do so in a relatively short time. As if this were not enough, the Internet has completed the chain by offering an alternative to conventional film distribution or exhibition streams, which are somewhat limited and controlled by the large business groups that manage the commercial circuits. The Internet has thus become a new agent in the communication ecosystem, particularly in the case of animation.

In fact, audiovisual media began to suffer the onslaught of the Internet when streaming video was made possible given the evolution of streaming transmission technologies. Streaming technology, which allows the user to reproduce audio or audiovisual content without needing to completely download to the device that displays it, appeared in 1995 at the hands of Xing Technology. However, the beginnings of digital video were earlier and date back to 1988, when the ISO/IEC working group Moving Picture Expert Group (MPEG) was set up. However, it was not until 1993 that they proposed the first compression standard, MPEG-1, which allowed for the storage of sound and image in optical media formats, such as video CD or CD-ROM (Niqui, 2011). However, the milestone that marks the evolution of the history of video on the Web is the appearance of shareyourworld.com, created by Chase Norlin in 1997, which allowed Internet users to share their videos. This platform can be considered the clear precursor of YouTube. The greatest

change contributed by ShareYourWorld and, subsequently, YouTube goes beyond offering new ways of distributing content: they have managed to empower users and turn them into producers and distributors of audiovisual material – functions that, until now, were reserved for producers and *majors*. In the words of Robert Kyncl and Maany Peyvan (2017, X), ‘while streaming services such as Netflix, Hulu and Spotify have done an incredible job distributing traditional content in new ways, open platforms such as YouTube have changed who is able to produce, distribute, and consume media’.

This group of new audiovisual creators, which Kyncl and Peyvan (2017) call streampunks, also includes animators who distributed their content on free digital platforms. They did so by adapting their creations to the characteristics of both new audiences and the new medium. As we have seen, these adaptations to the medium have given rise to new formats. However, YouTube's usage policies oblige users to comply with their requirements. Thus, the freedom of creation that the Internet ideally offers is subject to the limitations imposed by the conditions of use of the distribution platforms. Not all creations fit in YouTube.

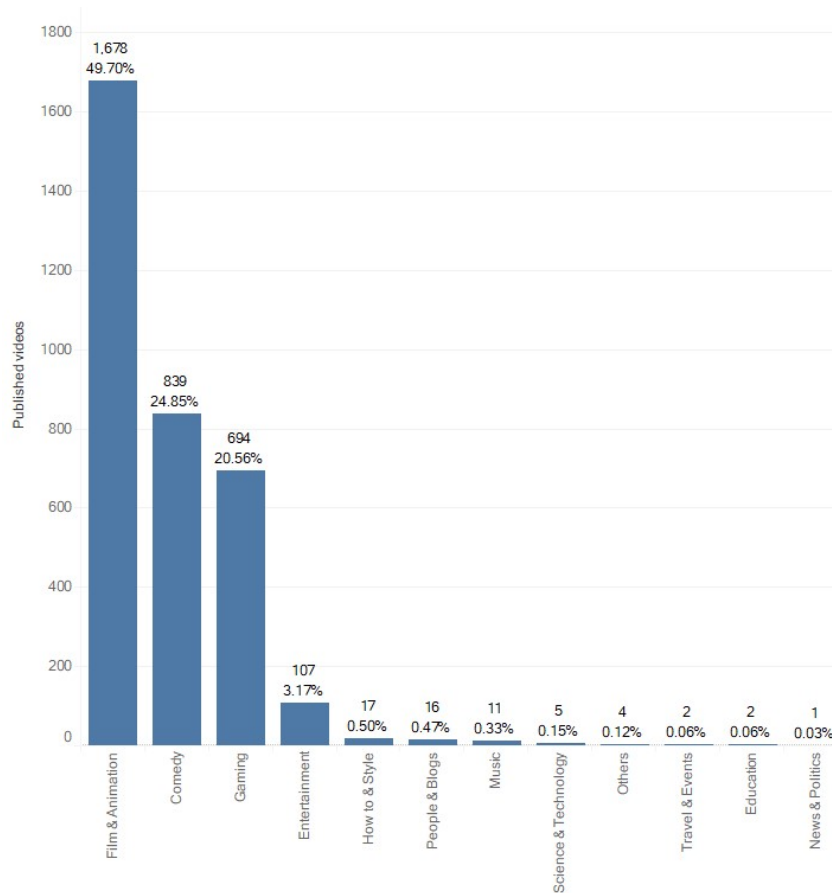
Family-friendly themes and for (moderate) teens

We have argued animations for Internet are not subjects to the restrictions of commercial circuits. New animators on the Internet who were oblivious to the requirements, customs, norms and pre-established business models and free from social and commercial pressure have therefore produced content outside of market trends. Thus, the Web was populated with animations of violent, satirical or erotic content created by these independent animators. The online animation is stripped of its link with children's audiences, and on platforms such as Newsgrounds, Twitch, Vimeo, Dailymotion and YouTube, addresses a new adolescent audience accustomed to moving around the Internet – an environment where they find different content from that offered by the *mainstream*.

By making the leap to YouTube, animators have redirected work towards more family-friendly subjects. However, when publishing on YouTube, animators must adapt their work to the publication policies and conditions imposed by the platform. When early digital animators occupied the Web on specific platforms (such as Newgrounds), the freedom to create was greater. This freedom is perceived in the themes and in the treatment performed on the animations. But when migrating to YouTube, the number of violent, eschatological and erotic scenes were drastically reduced, potentially due to the conditions and restrictions of use imposed by YouTube's Partners Programme, which only allows for the monetisation of non-mature content.

The conditions of use of YouTube have become a kind of censorship that, just like the imposition of the Hays Code for studio-era Hollywood cinema, causes the animation to favour familiar subjects. To address the typology of content, we strictly adhere to the data obtained from the classification proposed by the producers of the videos when they are published on YouTube. The 3376 analysed videos are part of 11 different categories¹⁰: 49.70% (1678) are presented as 'Film & Animation'; 'Comedy' includes 24.85% of the total (839); and 'Gaming' at 20.56% (694) was in third place. The remaining nine categories in total account for only 4.89% (165) of the sample. All of them comply with the use policies set by YouTube. The online animations are rarely aimed at children; there is a certain tendency to address issues aimed at young people or adolescents. When topics related to sexuality are dealt with too, it is done in a subtle way, to avoid being reported for non-compliance with the policies of use of YouTube. The distribution by category is shown in Figure 5.

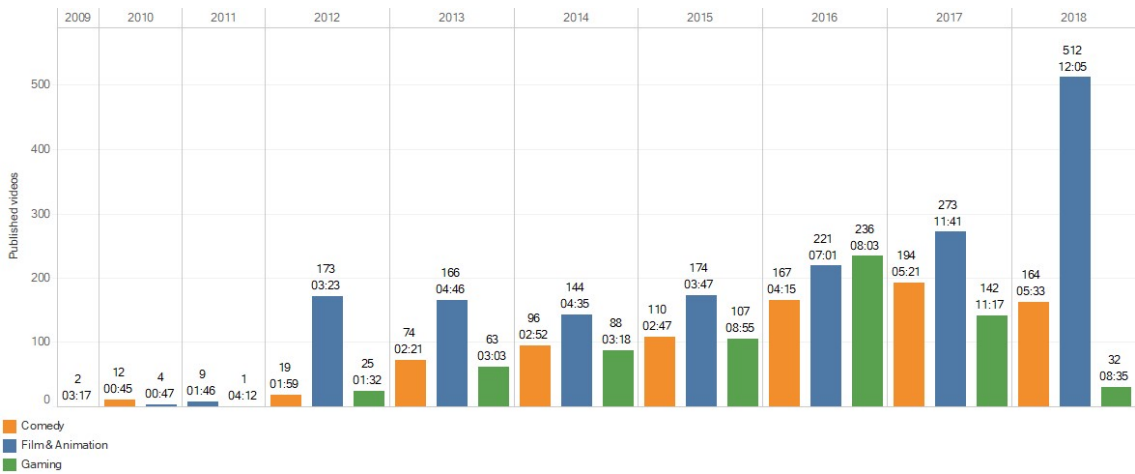
(Figure 5 HERE)



Of the production of these channels, 95.11% is focused on the categories of Film & Animation, Comedy and Gaming, with a total of 3211 videos. With the changes made in the YouTube prioritization algorithm that favour the duration of the videos, foreseeing that strictly animation productions would lose weight in favour of videos that are less laborious to produce seems reasonable, such as those in the 'Gaming' category. The data indicate that, although the 'Gaming' category occupied the first position in 2016 in both production volume (236 videos) and average length (08:03), the category 'Film & Animation' has led the ranking during the rest of the years. However, this category, in addition to containing animations, has

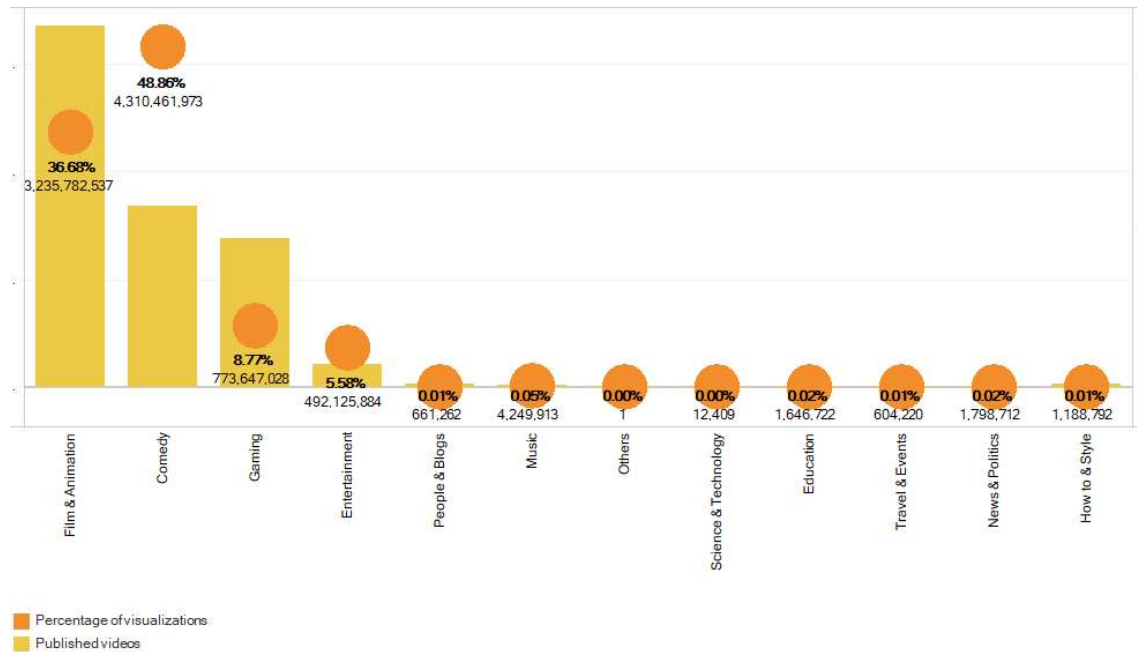
incorporated a new publication format: How To, life drawing and tutorial. We also find a large volume of Machinima production, Question & Answer videos or even reviews or unboxing of products (See Figure 6).

(Figure 6 HERE)



The content published under the ‘Comedy’ category is the most attractive for viewers, surpassing the rest of the categories in views. Thus, ‘Comedy’ concentrates almost 50% of the total views (48.86%), reaching more than 4,300 million hits with only 24.85% of the total content. ‘Film & Animation’, which brings together almost 50% of the total videos analysed (49.70%), includes more than 36% of the views (36.68%). For its part, ‘Gaming’, with 20.56% of videos, achieves just over 8.7% of the views See Figure 7).

(Figure 7 HERE)



YouTube official policies warn that ‘it’s not okay to post violent or gory content that’s primarily intended to be shocking, sensational, or gratuitous. If posting graphic content in a news or documentary context, please be mindful to provide enough information to help people understand what’s going on in the video. Don’t encourage others to commit specific acts of violence’ (YouTube, web). So, we can find some animation, such as ‘Baahubali 2’¹¹ by Creative Cartoon Animation, in which you can see some scenes of violence, or even productions such as ‘Skirim is epic’¹² (2011) by Pshychicpebbles, full of sexual jokes.

Instead, YouTube’s policies are not permissive regarding nudity or sexual content: ‘YouTube is not for pornography or sexually explicit content. If this describes your video, even if it’s a video of yourself, don’t post it on YouTube. Also, be advised that we work closely with law enforcement and we report child exploitation’ (YouTube, web). So, it’s unthinkable to find erotically charged animation content on

YouTube, like the ones that proliferate in Newgrounds. There the sexual content can be very explicit and is reflected in the character design, in the situations presented and even in the language used. When producing for YouTube, Newground's animators, such as Egoraptor, Creative Cartoon Animation or Psychicpebbles, had to apply self-censorship and give up certain themes.

Conclusions

Digital tools, in addition to favouring the industrial production of animation products, have again allowed the generation of author content, making possible the resurgence of a type of animation with a marked personal and artisan character. In this context, online animators, outside the restrictions of the industry and the market, can express themselves freely and address issues far from the commercial circuits. Many of the first online animators migrated to YouTube to increase their work's audience and to monetize their productions. While YouTube compensated the authors in proportion to the number of views, the animators obtained strong performance from the published videos. At the time when YouTube rated viewing time more than the number of viewers, animated videos lost their reach, and the economic return drastically declined.

However, the animation channels – at least those with a high number of followers – have continued to produce content for YouTube, increasing the number of productions, the rate of publication, and extending the duration of the videos. In order to maximize their production and meet these challenges, animators have resorted to three strategies: reducing the complexity of their works, creating limited animation pieces and create meta-animation content. Animation channels on YouTube have renounced violent or sexually connotated content and now offer family-friendly productions or aimed at young people. With these strategies, the animators follow the rules of the game imposed by YouTube, adapting to the requirements of the prioritization algorithm. Although submitting to a process of self-censorship

and giving up creative freedom does not seem positive, YouTube's animators have proposed new formats, aesthetics and production systems. Some of the channels that produce this new type of content (such as anime parodies, machinima animations, comic book dubbing or animated vlogs) have received strong public acceptance, with numerous followers and a significant volume of views. They are also positively rated by the YouTube prioritization algorithm. Thus, Youtube animations behave exactly like any other "New Media", at least in terms of the transcoding characteristic described by Manovich (2001): a transcoding phenomenon has occurred in which the digital layer – the algorithm – has influenced the cultural layer – the animation – affecting themes, techniques, treatment and duration and even, as this study has found, encouraging the emergence of new genres of animation.

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¹ YouTube Data Tools are available at <https://tools.digitalmethods.net/netvizz/youtube/>

² The channel id is a unique number that YouTube assigns to each channel at the time of its creation.

³ Data are available at <https://bit.ly/StreampunksOpenData>

⁴ https://blog.feedspot.com/animation_youtube_channels/

⁵ At the time of sampling, the channel 'Animated Surprise Eggs TV' did not show any video of its own, only playlists; the channel 'Brandows Animations | Animation Clips' had been canceled due to copyright infringement. The large studio or corporation channels have also been eliminated (two from Disney, one from Fox, one from Videogyan Kids Shows and one from Nickelodeon). In order to work with a total of 25 channels, it was decided to include the channels that occupied positions 26 to 32 of the ranking.

⁶ A definition of each of the formats can be found at <https://support.google.com/youtube/answer/2467968>

⁷ <https://www.youtube.com/watch?v=FkL4CickRZ0>

⁸ <https://www.youtube.com/watch?v=efD3nmwF-IM>

⁹ <https://www.youtube.com/watch?v=H1iH0Frsbeo>

¹⁰ In our analysis, we include an extra category ('others') in which we have grouped the videos that, for some reason, have not been automatically classified into any of the valid options.

¹¹ <https://www.youtube.com/watch?v=cjbxNa1Z62A>

¹² <https://www.youtube.com/watch?v=6DzB95M4eZ8>