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Netflix in Web of Science: a bibliometric approach

Abstract

Netflix has shaken up audiovisual industry, but what about academic research? This bibliometric analysis focuses on 210 papers indexed in Web of Science that address this issue. We examine the author, university of affiliation, language, journal. keywords, year of publication, citations received, and categories covered in WoS. We also conducted a quantitative analysis of abstracts and papers to identify the most recurrent methodologies, themes, and samples. Our results highlight a rise in Netflix studies in recent years and their tendency to analyse specific audiovisual works. There are many qualitative analysis of specific Netflix hits, but none of the shows particularly stands out. It also shows a rise in "Communication" and "Film, Radio & Television" papers (40% of them), although academic interest relies on Netflix corporate culture, business, and algorithm. These studies are mainly carried out using a qualitative methodology (83%). More than half of the articles focus on one of the Netflix series and, among them, the greatest interest lies in the representation of specific issues; gender, race and sexuality are present in 25% of the works in the sample (n=210). At the same time, among the 367 authors signing these research papers, the parity between men (51%) and women (49%) is almost absolute. It appears that the geographical and linguistic variety of papers is related to Netflix's global expansion and that the sheer number of titles covered reveals a fleeting attention due to Netflix's trademark: swift and concentrated consumption.

Keywords Bibliometric, Netflix, papers, series, television, Web of Science.

1. Introduction

In just over twenty years, Netflix has gone from being a DVD distributor, seeking to compete with Blockbuster, to become one of the world's largest multinationals, a leading distributor of television over the Internet. With forty-seven Hollywood Academy Award nominations and its international reach spanning 243 countries, Netflix has brought about a revolution comparable to what "we now associate with film's adoption of sound technologies in the late 1920s, the widespread adoption of television in the 1950s, the introduction of home video, specifically the VCR, in the 1980s, and the rise of the Internet in the 1990s" (McDonald & Smith-Rowsey, 2016, p. 3). Given its scale, Netflix is not an exception, but an established model with unprecedented acceptance among younger audiences and a major cultural impact (Steiner & Xu, 2018). At a business level, Netflix has generated a revolution that has completely changed the logic of the television medium and its history (Lotz, 2018; Mittell, 2015).

One of the many milestones achieved by Netflix was its breakthrough in an industry dominated in the late twentieth century by six giant corporations that produced 75% of television fiction -Comcast, Twenty-First Century Fox, Disney, Viacom, Time Warner, and CBS- (Holt, 2003). This was made possible by the company's strong commitment to linking television and the Internet. Following the path of earlier recording technologies (VHS, DVD and DVR), allowing viewers to watch their favourite programmes when they want, Netflix designed a way to enable audiences to create their own schedule (Jenner, 2014). Thus, Netflix could be viewed on any digital medium, anywhere and anytime (Greer & Ferguson, 2015). Moreover, its simultaneous release strategy meant that all the episodes of the same season could be watched in a single viewing. This strategy gave rise to binge watching, which the channel encourages as its primary form of consumption. This convergence has attracted interest from different fields of academic research: from the effect of the binge model on audience consumption (Rigby et al., 2018); its effect on the narrative structures of its series (Naranjo & Fernández-Ramírez, 2020); or on internet streaming, where Netflix already generates more than a third of all Internet traffic in the United States (Dwver *et al.*, 2018). The creation and consolidation of the binge model has also affected its competitors (such as Amazon Prime or Hulu), which have accepted the paradigm shift and modified their strategies (Hadida et al., 2020). The change proposed by Netflix is an increasingly common practice.

Beyond embracing subscription models and eliminating advertising, characteristics of the post-network era (Lotz, 2019), Netflix also played a leading role in computer science development. In an industry shrouded in corporate secrecy, between 2006 and 2009, the company organised the Netflix Prize: a contest to improve its recommendation algorithm, which involved making its matrices public. These data would become the reference database for many research projects and the starting point for the algorithm culture (Hallinan & Striphas, 2016). In order to know and control the behaviour of its users, Netflix made a big bet on the personalisation of the experience and the relationship between the platform and the subscriber: "we indeed relied on such an algorithm heavily [...] because in that context, a star rating was the main feedback we received that a member had actually watched the video" (Gomez-Uribe & Hunt, 2015, p. 2), state those responsible for implementing the algorithm. These strategies not only revolutionized the television landscape, but also positioned Netflix as one of the world's most innovative companies in the world (Lichtenthaler, 2018). Besides forcing its competitors to update and imitate its practices (Pierce-Grove, 2017), this change has had a profound effect on international legislation on such platforms (Lobato & Lotz, 2020).

It is also worth noting the impact of Netflix's international expansion, which has had repercussions for the local television and cinematic industries worldwide (Lobato, 2018). In just six years (between 2010 and 2016), Netflix reached 243 countries as a distribution platform for audiovisual content, becoming a powerful competitor for local broadcasters and platforms. Moreover, it has established itself in some countries as a creator and producer of globally successful national content. Phenomena such as *La casa de papel (Money Heist*; 2017-2021; Spanish), *Dark* (2017-2020; German) or 3% (2016-2020; Brazilian) illustrate how Netflix's involvement in national co-productions has stimulated the sector, enabling series with national aspirations to consolidate themselves as global hits. The relevance acquired by these products outside the US mainstream has had a substantial cultural impact (Buonanno, 2018). The emergence of Netflix in these markets has also changed the narrative and formal characteristics of the series that were made in those countries: episode lengths have decreased, the dramatical is prioritised over the comical, current social topics are shown in fiction, etc. (Mateos-Pérez & Sirera-Blanco, 2021).

As shown, the impact of Netflix has been wide-ranging and has affected multiple fields. Therefore, this phenomenon can be approached and theorised from different disciplines, objectives, and methodological points of view.

2. Objectives

Taking the scientific production in Web of Science (WoS) as its reference, this paper presents a bibliometric analysis on the presence of Netflix in academic literature until 2020. Given the dichotomy between the two major databases (Scopus and WoS) (Carrillo Vera, Aguado Terrón & Gómez García, 2018; Escalona Fernández, Lagar Barbosa & Pulgarín Guerrero, 2010; Santa & Herrero-Solana, 2010), Web of Science is chosen due to its higher reputation amongst its competitors, as other bibliometric studies restricted to this database do. Nevertheless, there are other studies based on Scopus (Segado-Boj, Martín-Quevedo & Fernández-Gómez, 2022), but the number of bibliometric analysis of WoS is clearly higher, particularly in communication. To name some examples, the first science map on this issue (using a bibliometric methodology) already opted for WoS (Montero-Díaz *et al.*, 2018), as did other analysis on film research (Gómez-Crisóstomo & Romo-Fernández, 2017; Fernández-Ramírez & Díaz-Campo, 2021) or the study of doctoral theses on the same subject (Repiso, Torres-Salina & Delgado López-Cózar, 2013). Other areas, such as education (Rodríguez-García, Raso Sánchez & Ruiz-Palmero, 2019) or psychology (Navarrete-Cortes *et al.*, 2009; Quevedo-Blasco & López-López, 2010; Zych & Buela-Casal, 2009), also rely mainly in WoS as their database.

Bibliometric research allows us to assess the dynamics of specific elements within certain areas of knowledge (Santa Soriano, Lorenzo Álvarez & Torres Valdés, 2018), taking into account issues such as the productivity of authors and institutions or the impact of their contributions (Piñeiro-Otero, 2016). The application of this methodology to the audiovisual medium has become relevant in addressing television research, thanks to the growing number of journals that fall within the categories of "Communication" (Montero-Díaz *et al.*, 2018) and "Film, Radio & Television" (de la Torre-Espinosa, Repiso & Montero-Díaz, 2019). In order to fully map how the scientific community approaches Netflix, this bibliometric study is extended to include a quantitative analysis of the methodologies and samples most frequently used (Segado-Boj, Grandío & Fernández-Gómez, 2015; Segado-Boj, 2020).

Applying a bibliometric approach to analyse WoS database will determine the interest Netflix has aroused in academia. This research aims to ascertain if the relevance and multifaceted nature of Netflix are reflected in academic publications. In other words: the goal is to determine whether the impact of Netflix on society, television, technology, industrial entertainment, etc. is reflected by academic studies or not. At the same time, we intend to show the trends and, if there is any, the regularity within these investigations (their methodologies, the fields in which they are included, the topics covered, etc.) and outside them (the authors, the journals, the geographical influence, etc.).

Additionally, based on the data extracted from the WoS database, we propose the following hypotheses:

- H1. Articles on narrative will be less cited than papers in other disciplines.
- H2. Humanities articles will be less cited than those from other disciplines.
- H3. Articles with a quantitative methodological approach will be more cited than those with a qualitative methodological approach.

3. Methodological procedure

This bibliometric research was carried on a sample obtained from the repositories provided by WoS. The database includes high-impact journals indexed in the Journal Citation Reports (JCR), Social Science Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), as well as emerging journals included in the Emerging Sources Citation Index (ESRI). The retrieval process began with a search for the term "Netflix" in the WoS catalogue. This first sample was refined by selecting only documents published in academic journals (i.e., papers and reviews) and deleting book chapters and other documents that did not meet these conditions. All categories and fields covered by the repositories were used to obtain a total sample of papers containing the word "Netflix" in their title, abstract, author keywords and/or Keywords Plus. The results of this retrieval corresponded to the data obtained from a search conducted on the first of December 2020.We exported 657 documents.

In the first content analysis, we excluded forty-seven titles that were erroneously listed as papers and other documents that did not meet this criterion, mainly book chapters classified with different tags. The remaining 610 items (602 papers and eight reviews) were screened again to determine whether Netflix was the main subject of the research or not. It should be pointed out that, among the titles excluded, more than half responded to algorithmic models derived from the Netflix Prize database with the purpose of presenting other nonrelated computational proposals (210 of the 400 articles eliminated). We also excluded 111 business papers, since they only mentioned Netflix to compare it with other companies that were the focus of the studies or regarded Netflix as part of a specific business context. Following the exclusion process, we obtained a final sample of 210 titles.

Data from two sources were used to obtain the results. Firstly, the variables provided by WoS itself:

1. Name of the work

2. Name of the author/s (from which the gender is deduced; if not, the corresponding investigation is carried out)

3. Nationality of the author's university of origin

- 4. Language of publication
- 5. Keywords
- 6. Journal
- 7. Nationality of the journal
- 8. Field of study in which the journal is included in WoS
- 9. Categories
- 10. Year of publication

11. Citations recorded in the WoS core

These categories provided quantitative information on the number of publications; their language; the name and nationality of both the authors and the journals where the studies were published; the number of journals addressing the subject; which ones publish the most about Netflix; the categories and areas of WoS where the subject predominates; and the years in which it received more attention. The keywords, categories, and fields of study from WoS allowed us to identify the most salient aspects of Netflix and the research trends on it.

This methodological process was extended to include a quantitative content study (Segado-Boj, 2020; Segado-Boj, Grandío & Fernández-Gómez, 2015) based on the information provided in the paper's abstract. On fifteen occasions, the abstract was not found in WoS or offered insufficient information for the study. In these cases, the full paper was consulted to perform the content analysis on the entire sample (n=210).

The abstracts and/or full texts contained the information necessary to classify the papers according to these variables:

- **1.** Methodology used (separating the qualitative, quantitative, interview-based, and experimental processes).
- 2. Theoretical perspective (the approach used for the research and, therefore, its objectives; for example, in the study of series, a distinction will be made between narratological studies centred on text analysis or investigations carried out regarding communication theories, focused on the process of reception and the relationship between the medium and the audience).
- 3. Subject matter (distinguishing the different objectives of the paper and defining the object of study; for example, technological studies can focus on the application interface, the filtering system, or the video flow on the Internet, etc.; similarly, those linked to social

sciences can study the distribution methodology, advertising strategies, international expansion, etc.).

- 4. Nature of the sample (analysing in a descriptive way the object being studied in this research; beyond the approach with which it is studied and the objectives, here it is determined whether the sample is made up of series, legislations, social networks, algorithms, etc.).
- 5. Sample (the specific title of the series, of the distribution company or the law, according to the examples in the last point).
- 6. Country of origin of the sample (if any and relevant).

From this information, the number of citations will be averaged according to the age of the article (considering the number of years since its publication). Given that the number of citations per year responds to a non-Gaussian distribution according to the Shapiro-Wilk test (p<.001), non-parametric contrast tests have been used; specifically, the Kruskal-Wallis Analysis of Variance to check the differences in the average number of citations according to the global area, the methodology and the subject matter.

4. Results

Although Netflix was launched in 1997, academic analysis on the company did not emerge until 2008. Between 2008 and 2014 (Figure 1), no in-depth attention was discernible, and publications on Netflix were sporadic. With the success of *House of Cards* (2013–2018), the first entirely Netflix's series, academic attention grew exponentially, with twelve papers published in 2015, the same number as in the preceding seven years. The second milestone occurred in 2018, when the number of papers increased from sixteen in 2017 to forty-five, coinciding with the company's worldwide consolidation. In the years 2018, 2019, and 2020, 73% of the studies on Netflix indexed in WoS were published.



Figure 1. Annual growth of research on Netflix in the WoS databases.

Source: Own elaboration.

The classification of journals addressing Netflix shows a clear dominance of publications linked to "Communication" and/or "Film, Radio, & Television," comprising 40% of the papers. To a lesser extent, studies in the "Business and Economics" category account for 7%. The only journal to surpass ten papers on Netflix is Television and New Media, followed by journals with similar interests such as Critical Studies in Television, and Media Culture and Society

(both with five titles). Again, the lack of regularity in communication-related magazines is due to Netflix's youth.

In nationality terms, English-speaking journals predominated, with United States leading Netflix studies (35% of the sample), followed by United Kingdom (33% of the research). Spanish journals, with twenty papers (10%), and Brazilian journals (10 papers, accounting for 5%) were second. These results are consistent with the language in which the studies were written, with 80% of the papers in English, 15% in Spanish, and 3% in Portuguese.

Netflix's infancy is apparent in the irregularity of studies on the company. Michael L. Wayne and Deborah Castro were the only researchers who studied Netflix on four occasions, while Amanda D. Lotz and Delicia Aguado–Peláez did so three times. Of the 367 authors who addressed Netflix on their research, 95% have only one entry. The researchers' origin (taking into account the university to which they belong) again shows a predominance of the English-speaking world and the interest stirred by Netflix in Spain. American universities lead the academic output on Netflix (30%), followed by Spanish (10%), English (8%), and Australian (6%). In terms of gender, the 367 authors are almost equally divided: 188 of them are men (51%) and 179 are women (49%).

Although the number of publications in the field of Computer Science that addresses Netflix as its main subject is marginal, its impact in the number of citations received far exceeds that of the rest. Three of the five most referenced papers address computational questions and account for 228 citations: *The Netflix Recommender System: Algorithms, Business Value, and Innovation* (Gomez–Uribe & Hunt, 2016) with 165; *Recommended for you: The Netflix Prize and the production of algorithmic culture* (Hallinan & Striphas, 2016) with 128; and *Measurement Study of Netflix, Hulu, and a Tale of Three CDNs* (Adhikari *et al.*, 2015) with 35. Of the 987 citations received by all the studies included in our research, 41% focus on technological studies relating Netflix's recommendation algorithm. Research included in the "Communication" and/or "Film, Radio & Television" categories made up for only 29% of the references.

The Kruskal-Wallis Analysis of Variance shows negative results for methodology (H(3)=5.67, o=.129) and positive results for global area (H(2)=28.5, p<.001) and subject matter (H(11)=39.1, p<.001). According to the Dwass-Steel-Critchlow-Fligner post hoc test, articles from Arts and Humanities are less cited than those from Technology (W=5.72, p<.001) and Social Sciences (W=6.34, p<.001), while there are no differences between those from Social Sciences and Technologies (W=2.02, p=.328) (Table 1).

Descriptive:		
	Area (global)	Cited Average (all database)
Avarage	Arts and Humanities	0.621
	Social Sciences, Law and Economics	1.22
	Technology	4.80
Standard Desviation	Arts and Humanities	1.98
	Social Sciences, Law and Economics	1.99
	Technology	9.60

 Table 1. Citations from each area.

Source: Own elaboration.

Significant differences in the subject matter are found between business and narrative (W=-6.7826, p<.001) and between computer science and narrative (W=-5.4672, p=.006). Again, the average for narrative articles shows a lower number of citations (Table 2).

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Table 2. Citations from each subject matter.

	Average	SD
Business	1,46	2,29
Narrative	0,649	2,02
Computer Science	4,8	9,6

Source: Own elaboration.

Our analysis of the 994 keywords that appear in the 210 papers shows that "Netflix" accounts for 7% of the total number of citations (Table 3). This is followed by communication-related topics such as "Television," "Media," "Streaming," "Intersectionality," and "SVOD." The most recurrent keywords were titles of series such as "Orange Is the New Black" or "13 Reasons Why," with nine and eight mentions, respectively. This is related to the high presence of communication studies in the sample and the interest they have in addressing Netflix series and their impact.







Our quantitative content analysis indicates that academic interest lies in character analysis, specifically those belonging to certain collectives (40%), of which women (6%) or LGTB people (4%) received the most attention. Analysis of the portrayal of suicide also stood out (7%). Netflix's positioning as a company within the television industry, its marketing strategies and its expansion process –among others– comprised 26% of the analysis. 11% of the papers address generic narratives issues such as character construction, plots and dialogues in Netflix productions.

At the methodological level, the qualitative analysis of specific television works was the topic of 60% of the works. Of the 63 works analysed, Netflix Original *13 Reasons Why* (2017–2020) generated higher academic interest (Table 4), mainly due to the impact of its depiction of teenage suicide. While the series aimed explicitly at alerting and raising awareness on the consequences of bullying, it had the opposite effect, seeing a disturbing rise in teenage suicides after its release. Although this occurred at the premiere of the first season (2017), academic research on this topic lingered in time (with 4 in 2018, 8 in 2019 and 6 in 2020) showing the tragic impact caused by the series and the importance of this phenomenon. *Orange Is the New Black* (2013–2019) also received considerable academic attention, mainly when analysing the series' high ratio of female, non-heterosexual and Afro-descendant

characters. Unlike *13 Reasons Why*, the presence of these studies decreases as the series fades and the novelty wears off, with 3 works in 2019 and none in 2020. *House of Cards*, the first of Netflix's original productions, was in third position. This production is analysed between 2015 and 2019 from different perspectives, taking into account the portrayal of politicians and journalists, fashion, character construction, Shakespearean influences, and the impact the series on other titles of the time. *Black Mirror* (2011-today), acquired from the British broadcaster Channel 4 as a rerun, is the only title in this list that is not a Netflix Original. The inclusion in the ranking of the most analysed episodes of this dystopian anthology, together with two series on paranormal phenomena *–Sense8* (2015-2018) and *Stranger Things* (2016today)– indicates a particular trend of interest for Science Fiction in academic research on Netflix. The attention given to *Narcos* (2015-2017) responds to the popularity of Netflix's Colombian adventure.





Source: Own elaboration.

Of the 210 papers in the sample, 128 of them deal with some (at least one) series produced by Netflix (61%). Despite this abundance, very few works analyse these works from a narratological perspective. Specifically, only 22 investigations (17% of the 128) aim to define the structural characteristics of the narrative. On the other hand, 106 of them (83%) adopt a theoretical perspective linked to the impact these products have had on society. These works are divided into two groups. Firstly, those that show the reaction of society and the behaviour of viewers to specific series (with 39 articles that account for 31%); among which the effect of *13 Reasons Why* on the teenage suicide rate and, for example, users' comments on Social Networks stand out. The other group corresponds to articles that analyse the representation of certain elements using a descriptive perspective based on content analysis. 67 of them (52%) do so and, focusing on, for example, the representation of the prison system or the role of women, analyse and criticize the characteristics of the works chosen as a sample. It is worth noting that 52 articles (41% of the series-based research; 25% of the total), regardless of the perspective or objective, address issues of gender, race, or sexuality.

The use of qualitative methodology stands out (83%) among the 210 studies in the sample. This methodology was used for both narrative and business-related aspects in studies analysing the characteristics and effects of the products or the company. In a more residual position (7%), quantitative research was applied less to communication and film studies (only four of the sixteen fall within these fields) and more to areas including psychiatry, computer science or social sciences. Experimental studies (7%) were also spread across fields. 6 of the 15 works employing this methodology are linked to the health sciences, with *13 Reasons Why* and its relation to suicide being, once again, the most recurrent theme. The least frequent methodology was the interview (2%).

5. Conclusions and discussion

In early 2013, when Netflix was preparing to release its first series, it only attracted half a dozen papers. Seven years later, the company played a pivotal role in the television industry, which was reflected in academic literature, with fifty-six publications on Netflix in 2019. The speed at which Netflix has grown and the fact that the vast majority of papers were published in the last three years implies there still are no authors devoted to investigating this topic. The youth of the company means that, for the time being, there are no researchers with an intense dedication to this subject; an issue that, as the years go by, may be solved.

The linguistic and geographical diversity (of authors, universities, and journals) highlights the impact of Netflix's international expansion. Its diaspora underscores its relevance in the English-speaking world and its impact in Latin American countries, indicating that Netflix is more than just a distributor or producer of audiovisual content and has already become a global cultural phenomenon. This means that Netflix's research is not exclusively focused on the United States and prevents a direct relationship between the company and its country of origin. This fact confirms Netflix's global impact and the effectiveness of its internationalisation process. Not only are its products consumed all over the world, but by impacting all the markets in which it has been introduced, it has produced changes that have been specifically addressed in each country. Apart from the international popularity of US fiction, the facilities provided by Netflix (creating a Video on Demand digital system that operates worldwide) and the impact and popularity of its works show a great geographical variety in research. Spain stands out among non-English speaking countries, being the first in terms of authors, origin of journals and language used. This coincides with the company's impact in this market. Netflix had one of the largest growths in its history in Spain; in just six months (December 2016 to June 2017) it doubled the number of subscribers (Garcia Leiva, 2019). Moreover, its strategy there was to ally with the largest company in the Spanish market (Movistar+) and thus prioritise union over competition (Castro & Cascajosa Virino, 2020). As it has been shown, the importance of Netflix in Spain not only impacts audiences and audiovisual market but is also reflected in academic production. Moreover, the emergence of Netflix coincides with the rise of academic studies on communication in Spain (Segado-Boj, Gómez-García & Díaz-Campo, 2022), allowing for a large amount of research on this issue. However, this result only reflects the scientific production indexed in WoS, which has a strong bias towards English spoken research. Future work should compare these results with samples from other databases such as Scopus or Google Scholar that include a wider geographical and language range (Delgado & Repiso, 2013). This would allow meaningful cross-national comparisons.

The study of keywords suggests Netflix has become an important communication topic. The impact Netflix has had on television studies is demonstrated by the considerable number of papers related to this medium. It is also significant that although the most numerous papers have similar characteristics (linked to communication and qualitative methodology), the ones most cited are related to computational subjects. The field of computing science, shaped by the Netflix Prize as far as the algorithm is concerned, monopolises the citations that papers receive on the company in WoS. Research linked to Social Sciences shows a similar behaviour compared to technological studies, greater in number but less citations. These facts show the wide variety of issues that arise from Netflix in terms of its works, as opposed to the thematic containment of the technological field. The merge of television and algorithms was revolutionary and, therefore, the number of studies on this matter is smaller, but with a greater impact. However, the company's series are varied and appeal to different themes which, due to the cross-disciplinary nature of communication studies (Delgado & Repiso, 2013), dissipate thematic homogeneity, a fact that impacts and reduces the number of citations

of each theme. On the other hand, the methodology used in each paper has no relevance in conditioning the number of citations of a study or its impact in its academic field.

More than half of the papers on Netflix in WoS analyse a specific work. However, the sheer number of titles covered reveals that the attention they draw is fleeting. Except for *13 Reasons Why* (for its impact on teenage suicides) and *Orange Is the New Black* (for its portrayal of minorities and collectives), no significant repetitions were found. Thus, we conclude that scientific literature is more interested in Netflix's culture and business strategies than in its series because their analysis is specific and timely. Ironically, the fleeting interest they receive is consistent with the business practices popularised by the company: compact distribution (the all-at-once release), and swift and concentrated consumption (binge watching).

Finally, although Netflix is addressed in academic literature more as a cultural phenomenon (regarding the study of its series) than a technological one, the papers linked to industrial and technological fields present a higher number of citations. Netflix's studies have significantly increased the number of "Film & Television" area papers in WOS, but they have not meant significant changes in its study. While attention is paid to the Netflix revolution in other fields, narrative studies neglect this issue and, when they do not, they fail to generate a high number of citations that would imply an unprecedented paradigm shift in this area. If Netflix series are so relevant in terms of narrative change, it should be analysed why this does not receive the same attention as their impact on the technological and industrial world.

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