



A Bibliometric Analysis of Over-the-Top Services Through VoSviewer

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Abstract.

Purpose of the study: This study attempts to find the publication & citation trends, bibliography coupling, co-authorship, and co-occurring keywords in OTT.

Methodology used: Metadata from Scopus (the most reliable database) has been extracted using the relevant keywords since its inception. 145 articles appeared in the database and were analysed using VOSviewer (free software).

Major findings: Publication started growing in 2018, and the maximum number of citations came in 2016. The maximum number of publications was done in the United States, followed by India, but India ranked low in receiving citations. With the development and wider acceptance of OTT platforms, Asian countries are emerging as major contributors to research related to OTT platforms. Co-authorship between India and the United States highlights the popularity of digital media in these countries, not just in viewership but also among researchers.

Summary: Publications trends, citation trends, bibliographic coupled countries, and co-authored countries' publication journey and co-occurred keywords are analysed to understand the OTT trends in this digital era (industry 4.). Thanks to internet transmission, technological advancements helped families use their TVs for web browsing and gaming, interact with content without restrictions or limitations and obtain exactly what they want to watch and whenever they want to watch. Over the Top (OTT) has made these experiences easier and smoother.

Implications: Growth in publications in the past few years suggests wider acceptance of this technology, which could emerge as a game-changer in the entertainment field in the coming years. Limited literature published in this field shows that the subject is still for future researchers.

Keywords: Over the top, VOSviewer, Technology, Experience, Bibliometric.

1 Introduction

Television (TV) has succeeded in bridging the communal viewing experience with the internet's interactivity, making it no longer a one-way medium. TV is slowly made available through platforms and interfaces instead of networks or schedules. It is now possible for television to be much more than a live-feed entertainment system thanks to technological advancements. Thanks to internet transmission, families may use their

TVs for browsing and gaming. Thanks to technological advancements, viewers can interact with content without restrictions or limitations and obtain exactly what they want. The development of Direct-to-Home (DTH) technology has also completely transformed how we consume premium on-demand video [1]. In the previous five years, there has been a sharp increase in demand for the best video distribution systems, which has been made worse by the Covid-19 pandemic. As a result, in these uncertain times, firms and professionals have a greater need to do their assigned work online and remotely by purchasing and utilising live streaming software[2]. Broadcasters host online events and stream live performances at physical venues to make money. Businesses use platforms for streaming videos for marketing, sales, and internal training. Television and radio stations hope to develop a sizable online audience by displaying videos. The primary factors that directly affect the usage of paid OTT services include age, monthly income, education, occupation, predisposition towards warm relationships with others, fun and enjoyment in life, self-fulfilment, and a sense of success. Different nations have different effects on adopting transactional and subscription video-on-demand due to demographic characteristics and consumption preferences [3].The emergence of several over-the-top (OTT) services has been aided by the rapid expansion of broadband networks and smart devices, which has altered the structure of content consumption. "Video content offered through an Internet or other Internet Protocol (IP)-based transmission path" is what the term "OTT" refers to[4].An increasing number of individuals view over-the-top (OTT) content through various channels, making OTT the main driver of global video and media consumption growth. OTT content, which is video distributed via the Internet as an alternative to traditional media, has gained significantly in popularity recently as compared to traditional video. The CAGR for OTT content revenues was above 40% from 2005 to 2017 and is predicted to be 20% from 2017 to 2023. In contrast, the growth rates for Public TV, FTA TV, and Pay TV between 2005 and 2017 were 2%, 1%, and 6%, respectively [5].OTT operators concentrate on services that capture and cater to user wants by understanding subscriber preferences in such a competitive industry. For instance, Netflix has a "Cinematch tool" that analyses content consumption trends and suggests comparable films. Thanks to specialised algorithms, YouTube regularly displays content that matches user tastes [3]. All these facts and figures suggest that OTT has huge market potential and a bright future as viewers switched from traditional TV-watching mode to fresh and bold content with minor government regulations.

2 Review of Literature

The entertainment industry is dynamic. It changed after every decade, and its present form is very different from its previous form. The rise of OTT platforms has led to the democratization of content. Also, the entertainment industry has become more inclusive. Various scholars have studied the impact of digital technologies on the entertainment industry. Earlier studies by scholars highlighted viewers' attitudes

towards the upcoming digital media [6]. With time online media became a powerful entertainment medium and began to challenge traditional media. [7] studied the various factors contributing to online media's growth. [8] further explored the strategic change adopted by traditional broadcasters. The study of the development of OTT platforms was not just limited to the marketing discipline but was also analyzed by researchers from various fields like engineering and communication. [9] made a major contribution by highlighting the relationship between various communication products and content services.[10] expanded the scope of a subject by applying the theory of planned behaviour (TPB) in studying the growth of OTT platforms. Various reports suggest that OTT platform viewership is not just limited to the young generation but is also accepted as a powerful mode of entertainment by the older generation [11]. The engagement tactics used by OTT platforms to engage young consumers were also explored [12].

3 Methodology

In the world of technology and digitalization, OTT has gained attention in a developing country like India, especially after digitalization. Various bibliometric study has been conducted on various emerging area, such as food waste [13], online food delivery [14], money laundering control [15], digital transformation [16], robotics and artificial intelligence [17] and so on. But the OTT market, which has vast potential and bright prospects, still needs to be explored through bibliometric analysis using VOSviewer [18] or Biblioshiny (R-tool) [19]. This study is an attempt to find out the answer to the research questions that emerged during the study –

RQ1: What is the publication trend in OTT?

RQ2: What is the citation trend in OTT?

RQ3: Which countries are bibliographically coupled in OTT publication?

RQ4: Which countries are co-authored in the publication journey of OTT?

RQ5: Which are the co-occurred keywords and their relevancy in the present scenario?

4 Analysis and Discussion

Over the Top (OTT) services/platforms gained popularity among researchers in 2018 and after that. 145 articles on OTT are found on the Scopus database, considered one of the most reliable databases. Metadata extracted using the keywords "over AND the AND top OR OTT AND services OR platform" extracted only 145 articles. Figure 1 depicts the upward trends in the publications and gaining popularity in the relevant field. OTT-related literature was first published in 2010, which was reduced to two and remained consistent for three years (2011-13). However, it again jumped to eight in 2014 and grew consistently, except in 2019 (only seven publications). The maximum contribution came in 2011, i.e., 25. The metadata was extracted until 18th April 2023,

and in three and half months, ten articles have already been published, which shows the rapid publication growth in 2023.

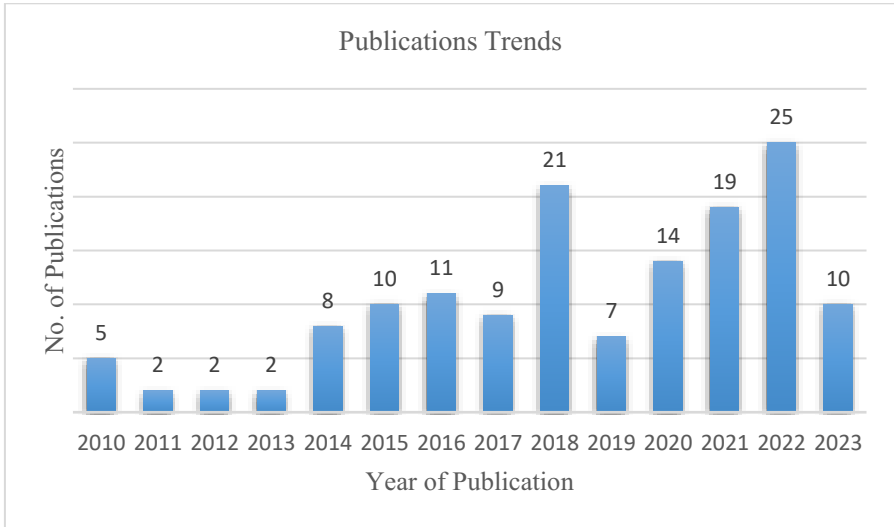


Figure 1: Publication trends in OTT

Citations are used as a performance indicator in the research field and also reflect the impact/quality of an article or journal [20]. OTT is an emerging concept that first appeared in 2010, and since then, it has gained popularity. OTT-related articles have received a total of 1084 citations at an average of 83 citations per year. Since 2014 it started getting a good number of citations, i.e. more than 100 citations, but a maximum number came in 2016, i.e., 255 citations, exhibited in Figure 2. Generally, older articles receive more citations than newer articles [21], but the present study received only 40 citations between 2010-13 (oldest articles). Most citations were received after 2013; even articles published during 2022 received 37 articles (youngest articles).

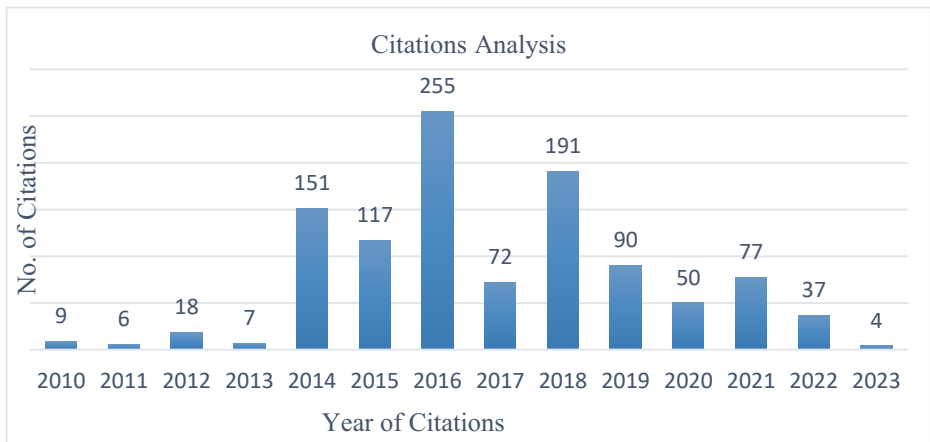


Figure 2: Citation analysis in OTT journey

The bibliographic coupling technique is used to understand the correlation between the same set of cited articles, which can help identify the latest research trends and track emerging literature in a particular field [22=23]. In the present study, Figure 3 & TABLE I represents the bibliographic coupling between countries. Countries such as the United States, India, and South Korea appeared as major countries. The United States has a maximum of 23 documents, citations (305) and a total link strength (TLS) of 1320. India ranked second in the publication list but received very few citations (27), relatively less than third rank South Korea (163 citations). 51 countries have contributed to OTT-related areas, but the major coupling between the top 10 countries appeared in TABLE I.

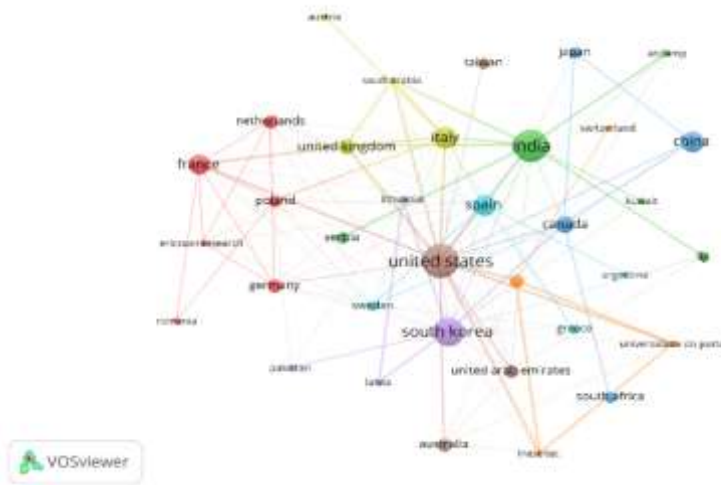


Figure 3: Bibliographic coupling of Countries (Network visualisation)

TABLE I: BIBLIOGRAPHIC COUPLING OF COUNTRIES

Rank	Country	Documents	Citations	TLS
1	United States	23	305	1320
2	India	21	27	765
3	South Korea	16	163	341
4	Italy	10	54	584
5	China	9	39	105
6	Indonesia	9	7	25
7	Spain	9	36	150
8	France	8	31	287
9	Canada	6	46	247
10	United Kingdom	5	19	640

The bibliographic coupling of the country (overlay) visualisation in Figure 4 depicts the emerging countries in the OTT-related work field. Countries marked in a yellow node (circle) are the youngest contributor. Mainly Asian countries (Pakistan, Saudi Arabia, United Arab Emirates and Kuwait) are emerging counties, along with Fiji and Austria. India also appeared new in this area but bibliographically coupled with various countries like Fiji, Kuwait, Saudi Arabia and Spain.

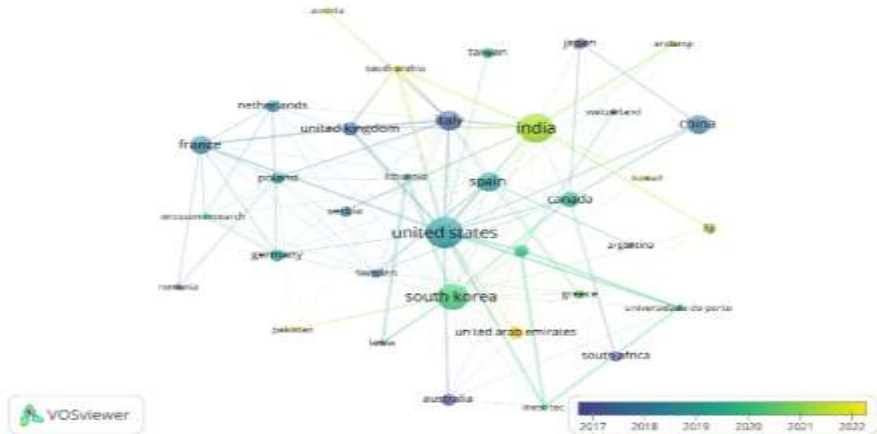


Figure 4: Bibliographic coupling of Countries (Overlay visualization)

Co-authorship is an inter-relational (social) phenomenon instead of an organisational-influenced impact and can be helpful in better understanding research tie-up [24]. In the present study, co-authorship countries have been presented in Figure 5 & TABLE II. The United States has the maximum co-authorship work with a TLS of 17 as they are the maximum documents contributor, followed by India and France. The United States have c co-authored with India, United Arab Emirates, Indonesia, Spain, France, Sweden, etc. It justifies the findings of [24], which highlighted personal relationships and contributions in a specific research area.

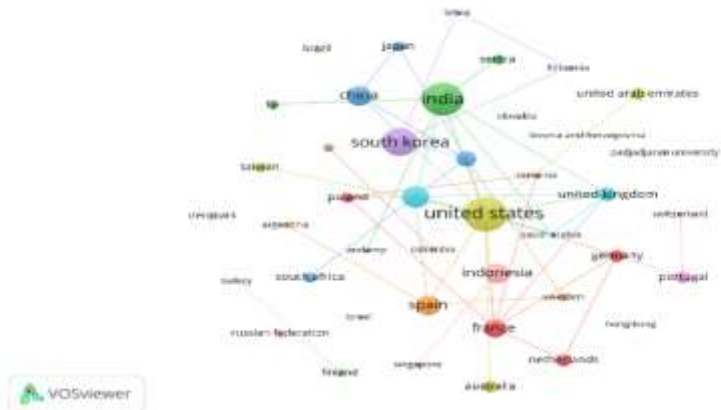


Figure 5: Co-authored country (Network visualisation)

TABLE II: TOP 10 CO-AUTHORED COUNTRIES

Rank	Country	Documents	Citations	TLS
1	United States	23	305	17
2	India	21	27	9
3	France	8	31	8
4	Canada	6	46	7
5	Italy	10	54	6
6	United Kingdom	5	19	6
7	China	9	39	4
8	Spain	9	36	4
9	Saudi Arabia	1	1	4
10	South Korea	16	163	3

Overlay visualisation of co-authorship of countries presented in Figure 6 highlighted the fact that countries like Fiji, United Arab Emirates and Saudi Arabia are young in this context but tried to collaborate with leading two countries such as the United States and India. Although India is also relatively young in this field, the tireless effort of Indian authors is getting rewarded.

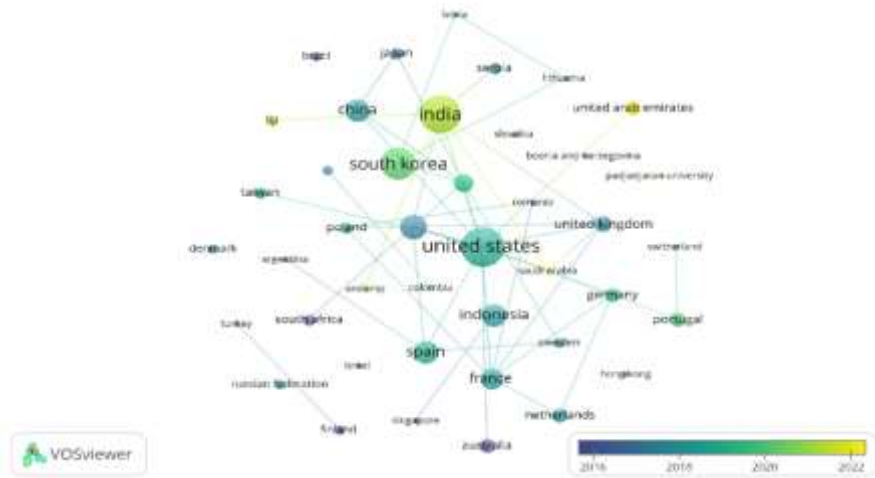


Figure 6: Co-authored countries (Overlay visualization)

VOSviewer software developed by [18] extracts the co-occurrence of author keywords. In the present study, the co-occurrence of author keywords in a particular field is divided into nine clusters marked in various colours nodes (red, pink, blue, sky-blue, orange, yellow, purple etc.) presented in Figure 7. These clusters are generated based on multiple themes such as video streaming, OTT, over-the-top services, platforms, quality of experiences, QOE, etc. The top 10 keywords in TABLE III are interrelated, such as OTT or over-the-top, depicting the same content. Video streaming and its quality are also a matter of concern in the context of OTT, which has gained popularity.

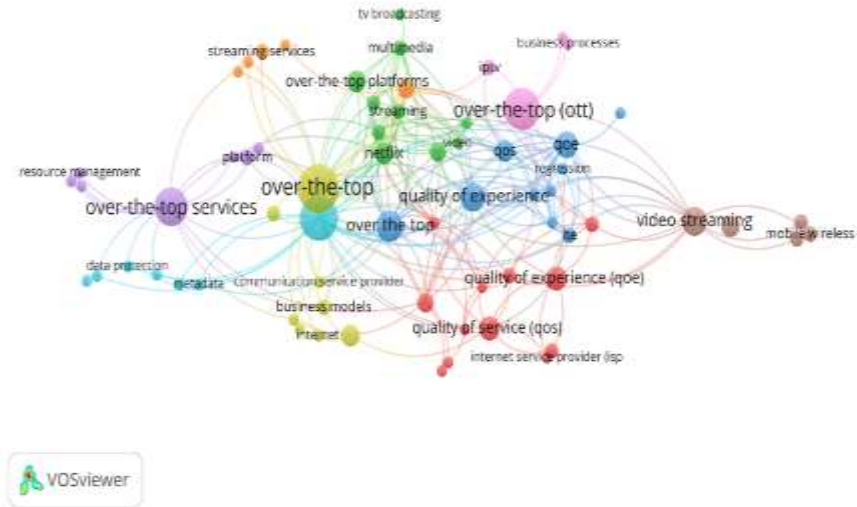


Figure 7: Author keywords co-occurrence (Network visualization)

TABLE III: TOP-10 HIGHLY OCCURRED AUTHOR KEYWORDS

S. No.	Keyword	Occurrences	TLS
1	Over-The-Top	19	30
2	OTT	17	53
3	Over-The-Top (OTT)	15	18
4	Over-The-Top Services	13	19
5	Over The Top	9	31
6	Quality Of Experience	8	28
7	Video Streaming	8	25
8	QOE	7	30
9	Quality Of Experience (QoE)	6	14
10	Quality Of Service (QOS)	6	11

Overly visualization of co-occurrence highlights the keywords that appeared in the different phases. Streaming, Streaming services, video, over the top platforms have gained popularity recently, as they appeared in Figure 8 with yellow colour node. It shows that OTT viewers are more concerned about services, quality, and streaming services. OTT service providers must be more careful in this aspect. Otherwise, the

viewer can easily switch to content providers providing everything the viewer is looking for.

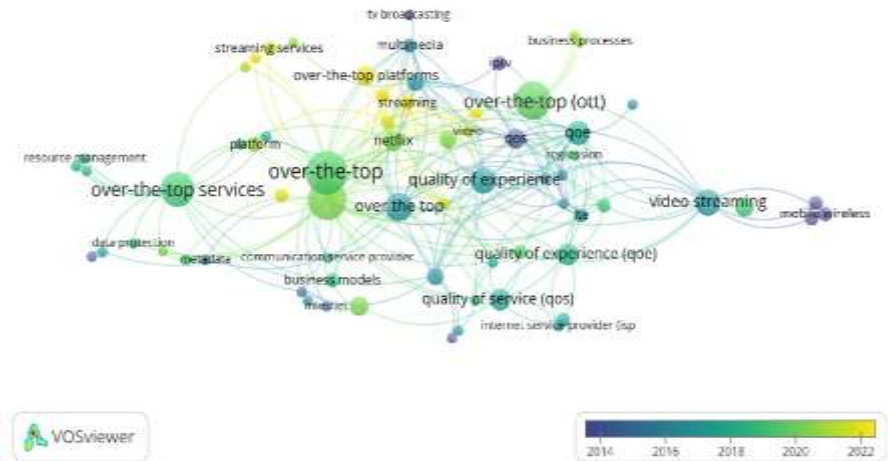


Figure 8: Autor keywords co-occurrence (Overlay visualization)

5 Conclusion

The Over-The-Top (OTT) industry has become a significant player in the entertainment and media landscape, experiencing rapid growth and presenting substantial market potential. Several key factors contribute to the success and popularity of OTT platforms, such as diverse viewer choices and limited government control, the rapid growth of the internet and a global reach, emerging market contributions, Viewer priorities, and competition and innovation.

Countries like the United States, India, and South Korea have been pioneers in the OTT industry, contributing significantly to its growth. These countries have well-established entertainment industries and have produced popular content for global audiences. Emerging countries like Saudi Arabia, Kuwait, and Pakistan are recognizing the potential of the OTT market and are actively participating in collaborations with major players. This cross-cultural exchange can lead to a more diverse content library.

OTT is an emerging area with huge market potential due to wider viewer choice and limited government control. Viewers are very selective in their watching patterns, the rapid growth of the internet, and its reach to diverse customers. The OTT concept is emerging, and the publication growth pattern undoubtedly justifies it. Viewers are more concerned about the quality of entertainment, video streaming quality, content and service offered on the OTT platform. It suggests that in the competitive market of OTT and digitalization, viewers always strive for content and experience. Therefore, OTT

providers should keep improving the video quality and content to easily extract the potential market.

6 Limitations

OTT-related literature is found less in number; therefore, generalising the finding is a challenging task. While analysing the metadata, some features, such as keywords analysis, were unable to determine; therefore, only author keywords were considered. Future researchers should examine the OTT on a little more extensive metadata and can compare the present research with new findings.

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