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**Research Article**

# Artificial Intelligence and Over the Top Platforms: Identifying Trends, Themes from Bibliometric Analysis

Madhu Rani[1*], Dr. Satendar Singh[2], Shagun Tomar[3], Dr. Manisha Gupta[4], Dr. Hari Shankar Shya[5]

[1*]Research Scholar, Sharda School of Business Studies, Sharda University, Orcid: https://orcid.org/0000-0002-1712-2042,
[2]Sharda School of Business Studies. Sharda University, satendar.singh@sharda.ac.in
[3]Sharda School of Business Studies, Sharda university, shaguntomar22@gmail.com
[4]Sharda School of Business Studies, Sharda university, guptaamanisha@gmail.com
[5]Sharda School of Business Studies, Sharda University, harishankar.shyam@sharda.ac.in

***Corresponding author:** Madhu Rani
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**ABSTRACT**

In this digital age of artificial intelligence and over-the-top (OTT) platforms, marketing and business innovation management entail employing technology to identify new methods to expand and engage customers. The application of artificial intelligence is becoming increasingly widespread in this sector of the rapidly growing industry Over-the-Top. Using R studio and data collected from Scopus database in the form of .csv file, the purpose of this study is to find how OTT and Current AI research has evolved over time. The primary objective of this investigation was to identify fruitful subfields of research that need further investigation. In order to conduct out a bibliometric analysis regarding AI and OTT, the "biblioshiny" package is used, in R studio software. It incorporates the study and analysis carried out for each specific research article that was published between the years 1999 and 2023. Information on the year of publication, authorship, journal title and source, country of origin, article kind, keywords, and language were all compiled for the aim of conducting an analysis. This article presents a thorough assessment of past studies on artificial intelligence and over-the-top (OTT) platforms, and it underlines the need for more research on the topic's consequences for ethics and society. This study aims to consolidate and evaluate the academic research that has already been done on artificial intelligence and over-the-top (OTT) services to set a sound agenda for further research. The emergence of OTT platforms and the increasing integration of artificial intelligence (AI) into these platforms has resulted in a growing corpus of study. A bibliometric study and literature on AI and OTT platforms uncover trends and topics in this subject. Over the past 10 years, the number of publications has steadily grown. This article provides a comprehensive summary of studies on artificial intelligence and OTT platforms, emphasizing the need for more studies on the topic's ethical and social implications. Trend toward the spread of OTT TV services obscures the major disparities that exist at the national level in both growth patterns and commercial efforts. Nonetheless, these variances do exist. The main goal of this study is to identify potentially fruitful research areas that need more examination

**Keywords:** OTT Platform, Artificial Intelligence, Digital TV, Streaming Platforms, Bibliometric Analysis, Digital Media Shift , Pay-TV, Digital Innovation

## Introduction

Consumers are increasingly abandoning traditional cable subscriptions in favour of streaming on OTT platforms. As per India's Media and Entertainment Sector Report, March 2019, OTT platforms are benefiting from the fact that there is no longer a significant pricing gap between TV and OTT services when users transfer from one to the other. A digital media streaming service that provides customers with access to music, video, and other content through the internet; often known as a 'over-the-top' OTT platform. Videos, TV shows,

music, news, and sports are just some of the media that can be accessed instantly on these sites.
Bypassing the need for a cable or satellite subscription, OTT services let viewers tune in from any internet-connected screen at any time. Because of this, many people have decided to ditch their cable or satellite TV packages in favour of OTT services, changing the way they access and consume information. No business, no matter how large or little, can afford to overlook the importance of using technological sources for marketing in the present digital age (Kumar, A. et al., 2021).

**Over-The-Top Platforms.** An OTT service, as defined by Goncalves et al. (2014), is one that provides premium video content over the internet using IP transmission. Netflix, Prime Video, Hotstar, Zee5, Voot are few examples of successful OTT service platforms. Most of these services include both licensed and original material, with others catering to niche audiences. OTT services have rapidly grown into a formidable rival to established media giants like broadcast and cable television. With their ever-increasing member bases, these sites are always adding fresh features and materials. Viewing experience, content richness, and user friendliness are three areas where a study shows OTT platforms are putting the most effort towards ensuring consumer pleasure (Jose, 2020).
OTT services stream media online. Because they own servers, databases, and content distribution networks, these sites offer on-demand media. Due to benefits like accessing material on any device, OTT services attract customers (Moyler and Hooper, 2009). Streaming Media Services (SMS) buys from studios, production companies, and distributors. They may also create original shows.
Content is encoded for streaming before dissemination. OTT video services are rapidly gaining popularity among both urban and rural audiences (Saha and Prasad, 2021). This procedure involves compressing video and audio files, adding subtitles or captions, and creating multiple versions for different devices and connection speeds. Consumers can retrieve the finished product via a server or cloud storage system.
The OTT platform's servers stream videos online. The user can watch it stream live. Viewers can search for certain series, genres, and related or unrelated suggestions on the OTT platform. Over-the- top service users increasingly prioritize on-demand access, exclusive content, high-definition video quality, and monthly membership costs (Nagaraj, Singh and Yasa, 2021). The software may also make recommendations based on viewing behavior. OTT services make money from subscriptions and advertising. OTT platforms need AI to deliver customized, high-quality content and services to users.

**AI (Artificial Intelligence).** is transforming enterprises and organizing innovative activity. In reaction to fast technology progress and the reorganization of human resources, AI may drive businesses to revamp the whole innovation process. The general public views artificial intelligence (AI) as a symbol of limitless potential Allam, S. (2016). Human connections (Acemoglu & Restrepo, 2018; Wang W. & Siau, 2019), urban organization (Guo et al., 2018), policymaking (Sun & Medaglia, 2019), and business practices and industries (Hilb, 2020) are all changing as a result of artificial intelligence (AI).
Several different sorts of algorithms may be used in AI (Domingos 2012). The use of AI in OTT platforms allows for a more personalized and optimized user experience, while also providing benefits for content creators and advertisers.
The article is structured as follows: Introduction — overview of topic and its primary goals are to familiarize the reader with over-the-top (OTT) services, OTT platforms, working of streaming platforms, Artificial Intelligence (AI), and the involvement of AI in the OTT field, while concentrating on the most important research issues. The next section is called Background of the study, and it begins with a discussion of the previously published research on AI and OTT and then the study proceeds with objective and research questions. After that, the paper presents an overview of research methodology, which includes the processes involved in data collection. Following that is the part where the analysis is done, and this analysis is done using R studio and the "biblioshiny" package. It contains research and analysis for each research questions.
Continuing to flow there is conclusion, which brings the entire research paper to a close. Following the conclusion are the limitations and the potential implications for the future.

**Artificial Intelligence and Over-The-Top Platforms Literature.** Artificial intelligence algorithms are used to examine a user's watching history and preferences in order to deliver customised suggestions for new material to watch. These recommendations are based on the user's interests and viewing habits, and can help to improve the user experience by suggesting relevant content.
Netflix's content is also influenced by the company's promotional tactics. This is especially pertinent in the realm of algorithms, as more and more companies within the media sector are turning to AI as a content producer (Siegel, 2020), Orange Is the New Black (Gentleman, 2019) were both created using algorithms by Netflix's content developers. All of the showrunners, directors, performers, and other creatives engaged in both programs were chosen in part using algorithms that predicted their popularity with viewers. Other content was also produced by the Netflix content creators.
Netflix has totally altered the media landscape by using the power of big data and artificial intelligence (Verganti, R., et.al 2020). Netflix has used AI to generate plotlines and character development for its hit show, "Stranger Things."
AI algorithms are also used to target ads to users based on their viewing history and interests. This ensures

that ads are more relevant to the user, and can increase the effectiveness of advertising campaigns. OTT services have expanded consumers' content choices and media consumption alternatives. AI has also enabled personalisation, suggestion, and optimization on OTT platforms. AI on OTT platforms is new, and research is expanding on its potential and implications.

Much of the research relies on contrasting two different phenomena. Although some researchers, like Chung (2014), have concentrated on Netflix's many services, others have studied the distinguishing features of OTT offerings and the historical context of their operators (Kim, 2015., Lee, 2012., Park, 2011). While examining how OTT services affect American media industries media sectors, Han (2014) created a model based on the TPC framework that took into account technological, commercial, regulatory, sociocultural, and political factors. Whereas Banerjee, Rappoport, and Alleman (2014) and Kim (2015) focused on the features and trends of OTT services, Cha and Chan Olmsted (2012) investigated the potential of OTT to replace the television entertainment paradigm. The Bibliometric literature is not yet accessible, despite the huge expansion of OTT media platforms. This means that a global indexing and abstracting database like SCOPUS should be used to monitor changes on OTT platforms via the use of appropriate and exhaustive keywords. OTT as a topic for study has lately garnered more popularity (Singh, N., Arora, S., & Kapur, B., 2022). Article explores the most recent developments in publishing related to OTT platforms, along with their respective advancements. In addition to that, the important terminology that is often used in OTT has been unearthed in this essay as well. This study also investigates the trends and issues that are now popular, in addition to determining the average amount of time required for the production cycle of research in the areas of AI and OTT on an annual basis.

The objective of this research is to conduct a bibliometric analysis of the literature on OTT platforms and AI to uncover commonalities and gaps in the literature. Bibliometric analysis is a quantitative research approach that examines the the production, dissemination, and impact of information using bibliographic data. We may acquire insights into research trends, important authors, institutions, and research issues in this area by evaluating the bibliographic data of articles on AI and OTT platforms.

Below are the Research Questions for the study, which is further investigated in this paper with the help of bibliometric analysis:

1. What are the publishing trends in OTT?
2. Which relevant words (keywords) have been frequently used in OTT research?
3. What are the trending topics in OTT?
4. When it comes to OTT, how typical is an annual production cycle of research?

## Research Methodology

The study of how bibliometrics can be applied to academic research is an important topic in modern educational research, and R software is a tool which is used for analytical mapping in many scientific disciplines. As a result of the growing body of literature and its relatively long existence, there have been a few topics that have received increased attention. A program known as Biblioshiny can be utilized in settings where the R statistical software is utilized. Users with little to no experience in programming are the target audience for this product (Gupta, M., Choudhary, B., & Sharma, D. (2023). The Bibliometric Analysis technique was employed in this work to discover and analyse the multiple publishing trends and tendencies linked with OTT and AI. The study uses R Studio and the package biblioshiny. The study's conclusions include keyword frequency, trending topics, themes, and so on. Graphs, charts, and network diagrams are used to present the results. The biblioshiny application is used to generate.jpg images as output and.csv files as input in this investigation.

Numerous reputable indexing and abstracting databases are accessible to scholars worldwide. Scopus and WOS are multidisciplinary databases, whereas MEDLINE, PubMed, AGRICOLA, and ERIC are subject-specific databases. Since they are often referenced in academic work, Scopus and WOS are the most preferred options among researchers. Researchers have looked at the SCOPUS database as a prospective resource for acquiring information regarding OTT platforms.

The following searches were used in the topic field of the SCOPUS database.

TITLE-ABS-KEY("over-the-top streaming" or "OTT" AND "AI" or "artificial intelligence") AND ( LIMIT-TO ( LANGUAGE,"English" ).

1. **Analysis of Publishing Trends in OTT:** 1.1 Reporting on trends in publishing include tracking and documenting shifts and developments in the volume, kind, and timing of published works. Figure 1 shows the Year of publishing and the published Trending Terms. "Over-the- top ott" services have the highest frequency of publishing (40 times) in 2021. In 2020, the phrases "video streaming" and "service providers" appear in print 30 times each, while in 2021, the phrase "video streaming" appears 30 times in print.

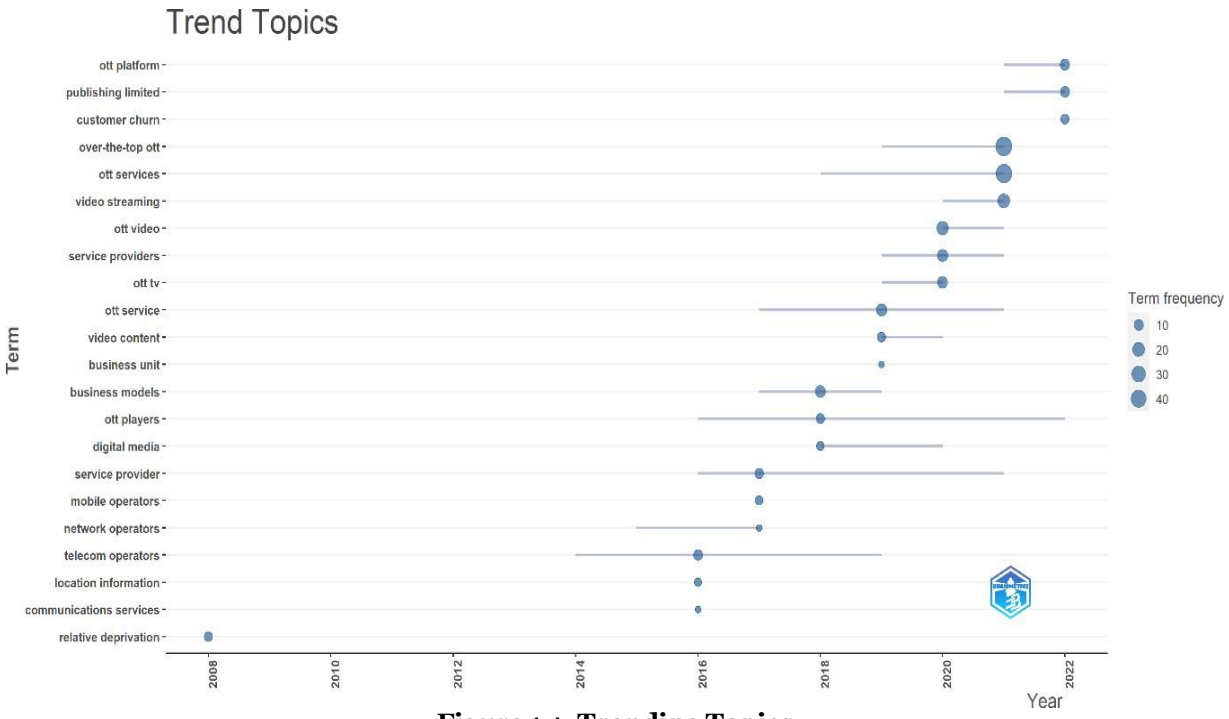


**Figure 1.1: Trending Topics**

Sources: authors self-created

2. **Analysis of Keywords:** 2.1 Keywords are a condensed and refined version of the article. The article's subject and overall direction in the field of AI and OTT are reflected in a clear and straightforward analysis of the article's key terms. Biblioshiny is a program that mines databases for information and does statistical analyses on the most frequently used terms in academic articles. Keywords are shown as a Word TreeMap using the biblioshiny program for data mining and statistical analysis of the high-frequency keywords. Figure 2.1 shows that "artificial intelligence," "over the top," "intelligence ai," and "OTT services" are the most often occurring phrases (with 7, 5, 3, and 2 occurrences, respectively) related to AI and OTT. It demonstrates that research into AI is taking place through ott, or over-the-top.


**Figure 2.1: Word TreeMap**

Sources: authors self-created

2.2 Word clouds are diagrams showing how frequently used words appear. Words that appear more often in the text analysis are shown more prominently in the final graphic. The popularity of word clouds has grown in recent years, which serve as a simple yet effective technique to draw attention to the article's most important topics Atenstaedt R. (2012).

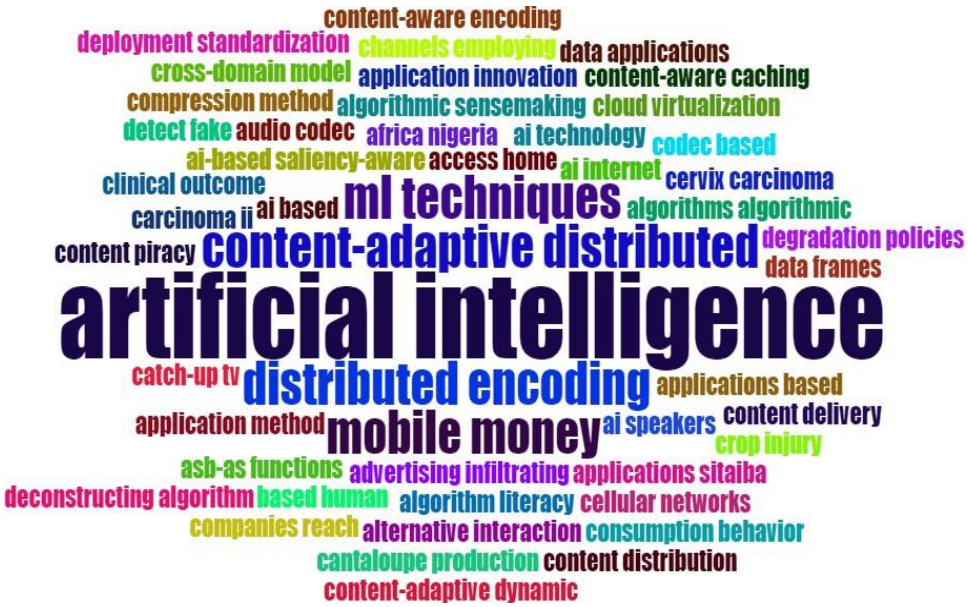


**Figure 2.2: Word cloud**

Sources: authors self-created

Keywords like "artificial intelligence," "content-adaptive distribution," "mobile money," "content delivery," "ai internet," "ai technology," and "many more" appear often in the study.

2.3. As shown in Figure 2.3, the relationship between Ai and OTT relies as a set of new technology- related phrases that have been reported by authors throughout the world. Undoubtedly, they include content, ott, AI, the internet, video services, artificial intelligence, and many others.

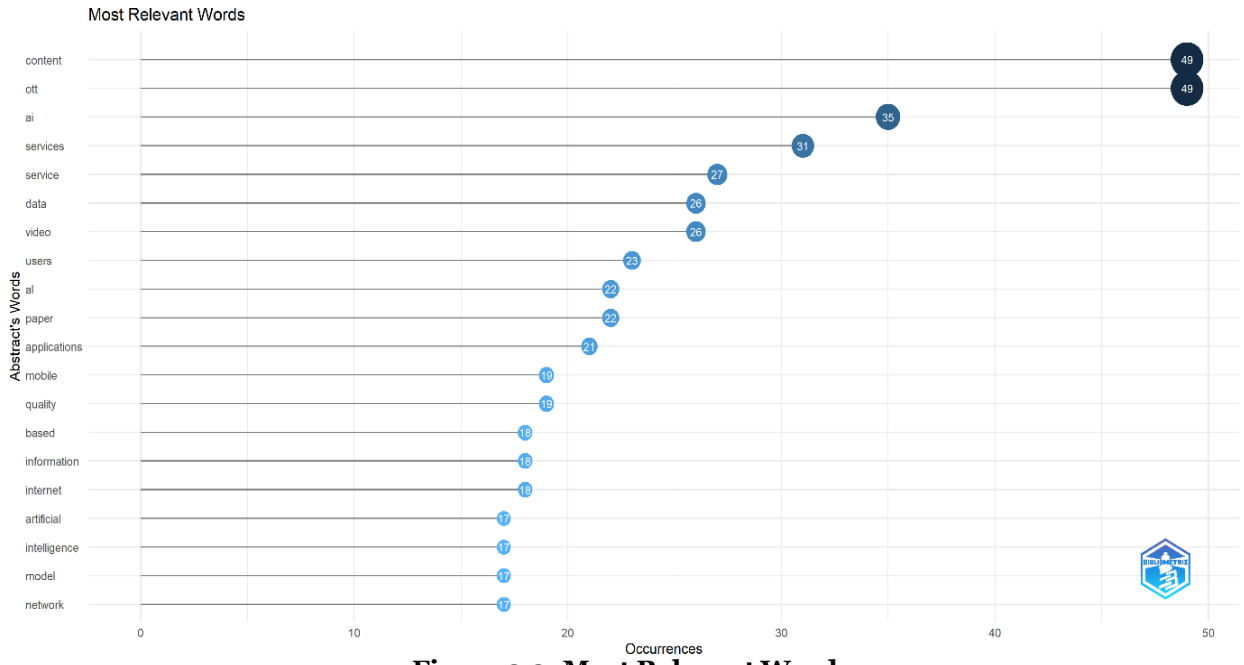


**Figure 2.3: Most Relevant Word**

Sources: authors self-created

3. **Analysis of Trending Topics:** Clusters of related keywords can be generated using co-word analysis. These are considered themes, and their density (on the y-axis) and centrality (along the x- axis) may be used to classify themes and create a map. Thematic maps are extremely intuitive diagrams that let us explore issues in relation to the quadrant in which they are located, as seen in the examples below. The four corners of the diagram are labelled as follows: The major themes are in the upper right, the basic themes in the bottom right, the developing or vanishing themes in the lower left, and the very specialized or niche themes in the top left (Cobo, M. J. et al., 2012).

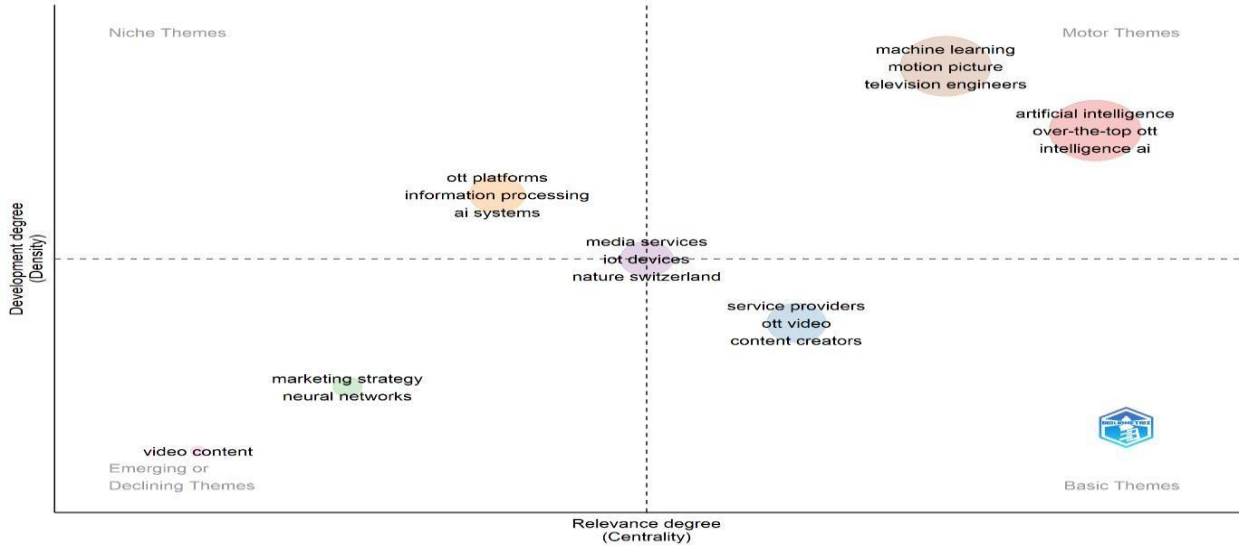


**Figure 3.1: Thematic Map**

Sources: authors self-created

The study's data set is depicted in Figure 3.1 thematic map, which shows that media services, iot devices, nature Switzerland emerged as the most prominent topics based on the relevant degree of centrality. The density can be used to express the overall impact of the topic. The first quadrant depicts the motor theme, signifying forward movement, while the thematic map analysis draws themes and subthemes. In second quadrant, dubbed "niche theme," selection of well-developed but rather narrow research subjects in the appropriate field of study. The emergent themes in the third quadrant are connected to the major research topic of the concerned study, while the core theme of the dataset is specified in the fourth quadrant.

4. **Analysis of Annual Production Cycle:** Figure 4.1 shows the literature published on the over the top with related keywords like AI, Artificial Intelligence, OTT. The data and visualization demonstrate that the peak years for literary output were 2020 and 2022. Equivalent production has been made in 2021 for the literature on the topic. Pandemic caused a spike in viewership of OTT media. Covid-19 has a greater influence on the usage of OTT platforms in urban areas since people there have more discretionary money than those in semi-urban and rural areas (Sharma and Dahiya, 2020). There have been many changes in the way we do things since the COVID-19 epidemic, and the education sector is no exception (Kumar, A., et al., 2022), neither is media industry.

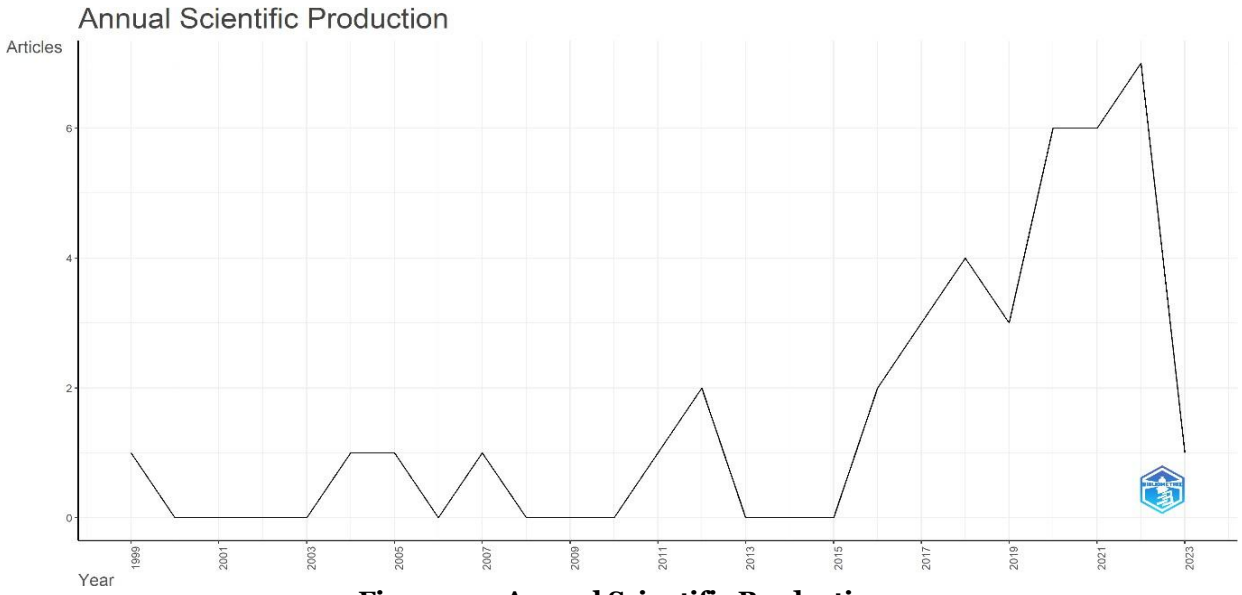


**Figure 4.1: Annual Scientific Production**

Sources: authors self-created

**Policy Implications.** The bibliometric analysis studies on AI and OTT platforms have similar policy implications, including promoting research and development in specific areas, fostering collaboration between academia and industry, addressing ethical and legal challenges, developing a skilled workforce, and

promoting the adoption of AI and OTT platforms in industries with the potential to be impacted. Nevertheless, the major themes highlighted by each research vary slightly, with some studies concentrating on specific topics such as deep learning, cloud computing, and big data analytics and others on more broad themes such as machine learning and natural
language processing. While formulating policy in this field, it is crucial for decision-makers to evaluate the unique results and recommendations of each research.

### Comparative Analysis of OTT and AI Bibliometric Research.

| Study | Research Period | Main Theme | Policy Implications |
|---|---|---|---|
| Study 1 | 2008-2019 | Impact of AI and OTT Platforms on Healthcare, Education, and Finance | Promote R&D in AI and OTT Platforms, Foster Collaboration between Academia, and Health Industry, Address Ethical and Legal Issues, Develop a Skilled Workforce |
| Study 2 | 2013-2018 | Impact of AI and OTT Platforms on Healthcare, Education, and Finance | Encourage R&D in Deep Learning, Cloud Computing, and Data Mining, Foster Collaboration between Academia, and Industry |
| **Study 3** | 2000-2018 | Machine Learning, Natural Language Processing, Data Mining | Promote Adoption of AI and OTT Platforms, Develop Regulations and Guidelines, Develop a Skilled Workforce |

Table 1: Comparative Analysis Table Sources: authors self-created

## Limitation

Our research has some limitations that are inherent in the database that we utilized. This implies that, despite Scopus being one of the biggest databases, there are still journals that are not included. The present study has a fundamental disadvantage in that it only covers research work from the SCOPUS database with a definite date. Other datasets gathered at other times, from different perspectives, and in different nations may have yielded different findings (Ye et al., 2020) and conclusions, but this option has been ignored. The integration of other legitimate databases, such as WOS, in future studies will give a distinct perspective as well as an element to comprehend the OTT study.

## Conclusion

In recent years, a proliferation of 'over-the-top' (OTT) services has emerged, as well as increasing integration of artificial intelligence (AI) into these platforms, has resulted in a growing corpus of study. A bibliometric study and the literature on AI and OTT platforms uncover trends and topics in this subject.
From our research, many key inferences arose. The first trend we saw was an upward trend in the number of articles covering this topic during the last decade, especially in the most recent years. This suggests that the topic of AI and OTT platforms is fast expanding and gaining academics' interest.
Second, we found numerous dominating themes in the literature, including content suggestion, development, analysis, and delivery. These topics highlight the different ways in which artificial intelligence (AI) is being incorporated into OTT platforms, as well as the potential advantages that AI may bring to these platforms and their users.
Finally, our bibliometric analysis gives a thorough picture of AI and OTT platform research. We discovered numerous major patterns and themes in this sector, emphasizing the necessity for more study on the ethical and social implications of new technologies. Researchers interested in the present and future directions of work into artificial intelligence (AI) and over-the-top (OTT) platforms, this article will be helpful.

### Future Direction.

AI and OTT technologies are automating human activities in many domains, which has many future ramifications. OTT systems automate TV and movie distribution. AI may customize products and services using user data. Algorithms personalize OTT content. AI data analysis and prediction may improve corporate operations. AI optimizes OTT content delivery by analyzing viewership.

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