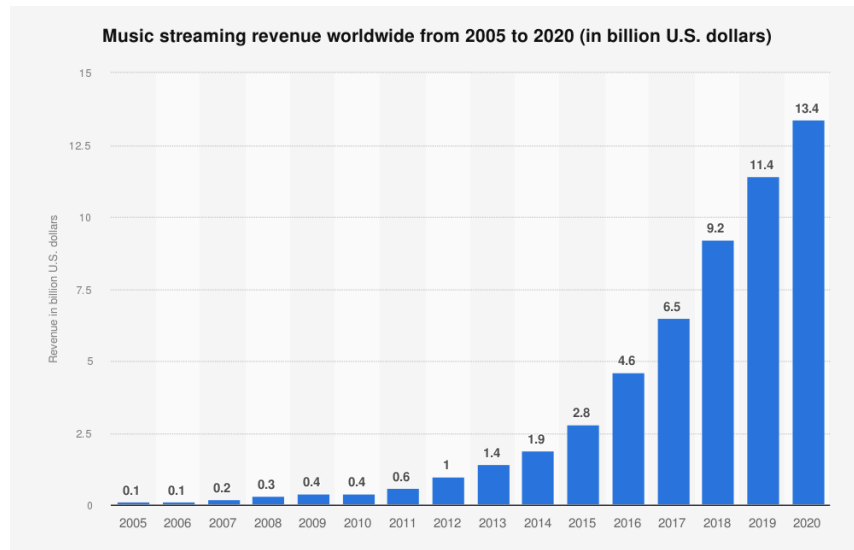


# **Surveying Old and New Recommender System Techniques for Music Recommendation**

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## Introduction

Online music streaming has become a dominating market in the age of the internet, with a steadily increasing global revenue year-by-year, as seen in Fig. 1. The demand for online music services has steadily increased as music listeners move to the web to enjoy music, and musical artists and composers move to the web to share and sell their music. Early business models for online music distribution were centered around selling songs and albums as individual purchases for users. A major selling point at this time was the provider's expansive song library available, and ability to quickly pick up new popular releases.



**Fig. 1:** Chart depicting the growth of worldwide revenue generated from music streaming in billions of U.S. dollars.

However, with the rapidly growing amount of music being released every year, some streaming services have sought to use methods to help users explore their ever-growing libraries. These motivations help fuel the need for music recommendation, a task best achieved with predictive systems using machine learning. As with all tasks for item recommendation though, there are many challenges associated with effectively recommending music to users due to the properties of the items to recommend and the specific needs and expectations of the users.

In this paper, I have decided to highlight the primary methods being used to overcome the challenges associated with music recommendation to better appeal to users, as well as consider the ways music recommendation systems can be improved beyond traditional objective measures of accuracy. The paper is broken down as follows: Section 1 introduces recommender systems in the field of machine learning with an exploration of challenges faced and techniques used by such systems. Section 2 considers how and why recommender systems are used for the task of *music* recommendation, which holds its own unique challenges. Section 3 highlights some methods for content-based recommendation in the realm of music, while section 4 looks at

collaborative-filtering techniques. Section 5 presents some of the sources of context that can be used to improve recommendation accuracy. Section 6 presents research into conversational music recommendation, a lesser-common branch of recommendation systems for music. Finally, section 7 presents three leading music streaming services, their methods for recommending music, and the advantages they bring to users. In section 8, I present my closing thoughts on the current state of music recommendation in-terms of current topics of research, and major applications.

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