

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF
SUPPLY CHAIN AND INFORMATION SYSTEMS

Impact of artificial intelligence on digital platforms

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SPRING 2024

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Management Information Systems and Economics
with honors in Management Information Systems

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ABSTRACT

The purpose of this research is to understand how the launch of generative artificial intelligence (AI) has impacted the customer experience on digital platforms. To explore the proposed research question, this thesis will define key terms, understand differences in customer reviews in pre and post AI periods, and determine the benefit of generative AI integration on digital platforms. This paper will discuss different types of digital platforms with a focus on streaming and social media. Spotify, Facebook, and TikTok will be used to examine broader trends in their respective industries. Through an analysis of customer reviews across the three platforms, the value of adding generative AI features will be investigated. Existing advancements have improved the user experience and a continued investment in generative AI can allow companies to stay ahead of the curve in their industries. As a result of the completed research, it is recommended that companies consider generative AI integration on their digital platforms and establish the most appropriate ways to use generative AI as an enabler to increase efficiency, productivity, and user interfaces.

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ACKNOWLEDGEMENTS

I would like to thank Assistant Professor Keran Zhao for his guidance throughout my thesis process. His knowledge and feedback were crucial in the development of my thesis, and his encouragement was invaluable. In addition, I would like to thank Dr. Saurabh Bansal for providing me with the opportunity to complete my thesis and his advice during the process. A final thanks to my family and my friends. To my family, thank you for instilling the value of education in me and their constant love and support to be the best version of myself. A special thank you to Kayla Anthony for her consistent motivation to keep going and Gabriel Rodriguez for his belief in me to push my limits.

Chapter 1

Introduction

The concept of artificial intelligence (AI) has existed for decades. Its earliest presence was prototyped by Alan Turing who leveraged machine intelligence during the World War II by decoding German naval codes using the famous Enigma machine. More recent AI developments have served as pivotal points for technological advancements increasing the urgency and need for businesses to integrate AI into their daily operations. In an article released by McKinsey, “The economic potential of generative AI: The next productivity frontier,” it states that generative AI could boost the economy by \$2.6 trillion to \$4.4 trillion annually (Chui et al., 2023). This article highlights the new potential opportunities created by generative AI technology. Its presence across every industry is not going unnoticed and is requiring companies to respond. AI’s long-standing history in the realm of business has allowed companies to automate tasks, reducing labor costs and increasing efficiency of daily operations. These past improvements provide a glimpse into the power of how AI can transform industries and spark an interest in how to leverage it for future use.

This thesis aims to understand if there are benefits of generative AI features on streaming and social media platforms through qualitative and quantitative analysis. There will be three primary sections for the research conducted. The first section will focus on qualitative analysis such as reviewing existing research in this space and prior trends of AI in the streaming and social media industry. By discussing the development of AI over the years and its interaction with digital platforms, it can help predict how AI may have an influence in the future. The second section will focus on an empirical analysis, which includes sentiment analysis and

regression to uncover quantitative findings of customer reviews in pre- and post-AI periods. The closing section includes the conclusion and recommendation based on key insights made in the previous sections. This will help recognize the practicality of this research for interested parties and how to navigate the use of generative AI space on specific digital platforms. The three sections will help answer the primary question of the impact of generative AI on digital platforms and the value of integration.

Chapter 2

Research Background

This chapter will focus on defining key terms including artificial intelligence, digital platforms, taxonomy of digital platforms, and identifying trends in the streaming and social media industry. The aim is to provide a thorough understanding of foundational concepts that are focal points of this research.

Artificial Intelligence

Artificial Intelligence, or AI, refers to the intelligence of machines. It serves as a technology that provides computers with the ability to have human-like qualities and problem-solving skills (Scott, 2023). There are various subsets of AI including machine learning and deep learning, two of the more commonly known disciplines (refer to Figure 1 for a detailed timeline of AI development). This research will study the generative models of AI.

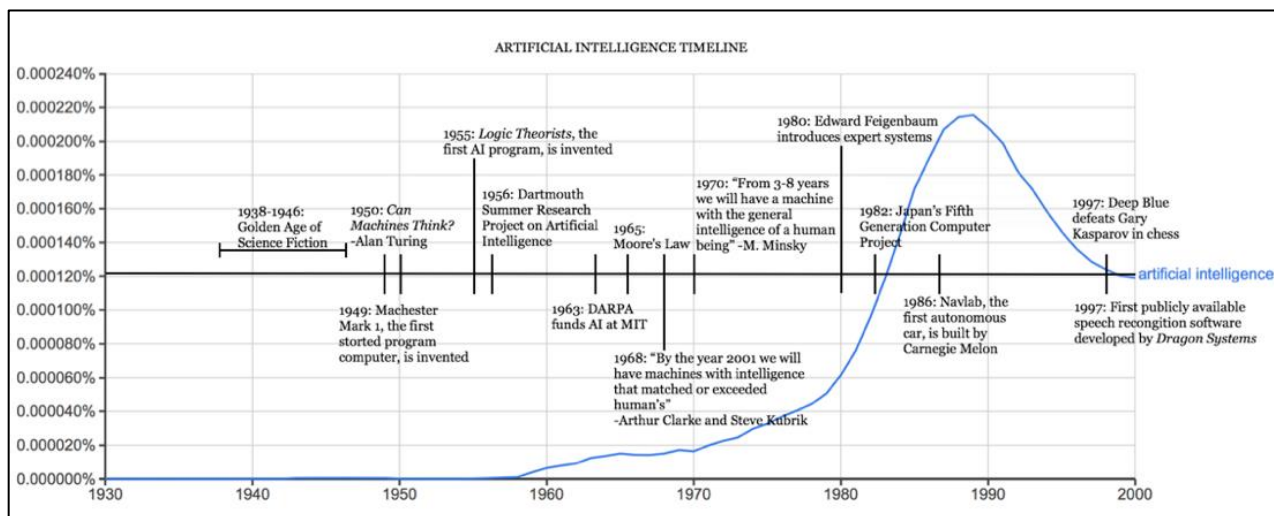


Figure 1. Artificial intelligence timeline (Anyoha, 2017)

According to IBM, generative AI can be defined as a deep-learning model that can generate content (such as well-written texts and quality images) based on input data the model was trained on (Martineau, 2023). The release of ChatGPT (Chat Generative Pretrained Transformer) on November 30, 2022, by Open AI highlighted a wide range of revolutionary abilities helping drive value across a multitude of industries. While AI has existed for years, generative AI sets itself apart from traditional AI in a few ways. One of the largest differences between the two is that traditional AI focuses on the analysis of data to make predictions whereas generative AI uses the data provided to learn and generate new data based on its training set (Marr, 2023). Its unique capabilities to be dynamic and adapt to various industry needs expands beyond traditional AI capabilities hence its revolutionary status. For example, tasks that required necessary skills and qualifications (such as, a software or computer engineer) can be done within a matter of seconds using generative AI.

Generative AI has a powerful architecture and a wide range of applications allowing it to be a highly practical solution across many industries. The ability to create new data, provide insights into the customer experience, improve personalization, and integrate with other technologies is allowing businesses to optimize their operations (Spilka, 2024). As expected with recent technology, there is a myriad of risks and opportunities that come along with it. AI models are in their development phases with new revisions and improvements coming out in each of their latest versions. The continuous and rising cycle of AI development has introduced the demand for areas such AI ethics, use of responsible AI, understanding privacy concerns, bias, regulations around the use of AI, and more (Marr, 2023). Companies and leaders will have to closely monitor their environment as new legislation is released. With any new field, there is a considerable amount of research and development that needs to be invested. As per the Financial

Times, generative AI investments were well over \$2 billion in 2022 (Minevich, 2023). The rapid-growing field of generative AI (refer to Figure 2) is transforming how businesses will operate in the future and introduces the need for industry leaders to innovate by leveraging this emerging technology. Overlooking the prospective utility of this technology may lead to businesses falling behind their counterparts.

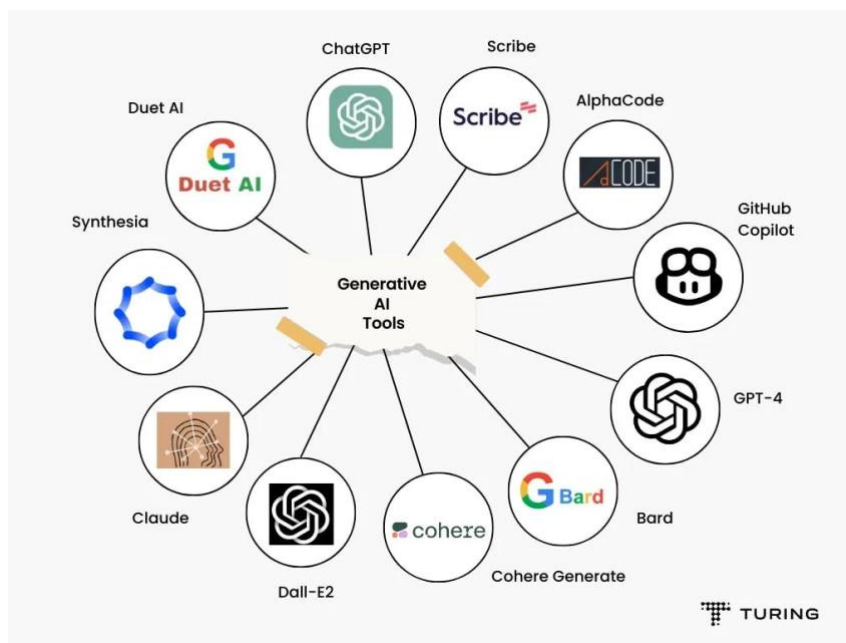


Figure 2. Generative AI Platforms (Sharma, 2024)

Digital Platform: Overview and Types

The rise of social media and streaming services is not foreign news. After the COVID-19 pandemic, there was a rise in media consumption. The bans of the pandemic, such as lockdowns and social distancing, had permanent effects on how customers relied on online media outlets to spend their pastime. 41% of US consumers seek new forms of entertainment and enjoy watching TV/video now more than did pre-pandemic and 39% of consumers reveal they spend more time

on their personal gadgets post-pandemic (Forrester, 2021). These data points display an opportunity for businesses to capitalize on in the digital platform space.

A digital platform is an application used to unify and streamline business operations and IT. It acts as an enabler for providing goods or services and information exchange from producers to customers. In addition, it creates an online community that amplifies value by supporting one another on the digital platform (Patrizio, 2023). There are several types of digital platforms categorized based on their functionality and purpose. The platforms range from media-sharing to service-oriented, catering to differing needs of customers and allowing for businesses to create a better customer experience by improving access to data insights, increasing their efficiency, and adapting to upcoming trends (Watts, 2020). Content-focused digital platforms are an umbrella term for streaming or media-sharing platforms. The streaming industry can be identified as an online provider of entertainment through short videos, music, or movies. Providers deliver content via the Internet on the subscriber's device (mobile device, computer, TV, etc.). With a similar operating purpose, social media platforms provide a space to create community and network with people. Its interactive features (post, likes, comments) allow users to upload and share content, such as text, audio, images, and video, on the platform and connect with others through their profiles. Along parallel lines of creating a community, knowledge-based platforms are online repositories of information that can be used as educational resources within the academic community. These platforms are available for information exchange from subject matter experts or individuals interested in developing their knowledge in a specific area. These platforms allow the users to store and share information along with problems, frequently answered questions, and best practices. Lastly, service-oriented platforms can be broken down into categories such as e-commerce, financial, business collaboration, transportation, and more.

These platforms are tailored to different services such as buying and selling products, facilitating collaboration amongst teams, or allowing customers to book travel experiences. Refer to table 1 for examples of these diverse types of digital platforms. For this research, we will be focusing on streaming (classified under content-focused digital platforms) and social media platforms.

Table 1. Examples of different type digital platforms (Watts, 2020)

Type of digital platform	Company examples
Content-focused	Netflix, Amazon Prime Video, Hulu, YouTube, Vimeo, Spotify, and Apple Music
Social Media	Facebook, Twitter, Instagram, Snapchat, TikTok
Knowledge-based	Quora, Stack Overflow, Yahoo! Answers, Udemy, and Coursera
Service-oriented	E-commerce: Amazon, Etsy, eBay Financial: Venmo, Zelle, PayPal Business collaboration: Slack, Zoom, Microsoft Teams Transportation: Uber, Airbnb, and Grubhub

Streaming Industry Trends

The broad streaming industry can be further segmented into TV shows, movies, music, and more. Streaming services are on-demand online entertainment for any type of media. This research focuses specifically on the music streaming industry. Four key players dominate this industry in terms of revenue and market share: Spotify, Apple Music, Amazon, and Google. Due to the protection of intellectual property rights, the industry is highly regulated, and the Recording Industry Association of America (RIAA) is a supporting resource for companies. The RIAA works with companies by fighting for state and federal policies to boost the modern music ecosystem. Trends in the industry have ranged from increased product portfolio due to a higher

number of artists releasing music, rising discretionary income to spend on subscription services, and changing consumer demand leading to market saturation (Pigott, 2023). Given the high volatility of the industry, there are key factors to ensure success. As per IBISWorld, access to the latest technology and ability to quickly adopt allows top players to stay ahead. This is crucial as this paper is analyzing how the release of technologies such as generative AI can be influential on such platforms. To further understand the abundance of opportunities, Table 2 highlights statistics to show the revenue, profit, and number of businesses in operation in the industry as of 2023. The music streaming industry will be explored through publicly available data on Spotify, a digital music service that gives you access to millions of songs and a top industry player.

Table 2. Music streaming industry characteristics (Pigott, 2023)

Characteristic	Music Streaming Industry
Revenue	\$17.7 Billion
Profit	\$1.2 Billion
Businesses	649

Social Media Industry Trends

Social networking sites, or social media platforms, are services that connect individuals across the internet where they can share content, interests, and create connections. As the internet becomes more integrated with everyday life, there has been a rapid growth in users on social media platforms. As for regulation in the industry, there is moderate regulation relating to privacy protection and intellectual property rights, such as the Digital Millennium Copyright Act (DMCA). Top players in the industry, based on revenue, are Meta Platforms, Inc., LinkedIn

Corp, and Twitter, Inc. The accelerating growth of internet usage and widespread use of social media has resulted in these platforms to be early adopters of modern technologies to create the best user experience possible. (Petridis, 2024). The rise of this industry had led to increased opportunities in an environment where barriers to entry are moderate. This creates tremendous value for the exploration of implementing generative AI measures to connect individuals across the world. The social media industry will be explored through publicly available data on Facebook and TikTok. Facebook is a social media and social networking service under Meta Platforms, Inc., an American multinational technology conglomerate that owns and operates multiple digital platforms including Instagram, Threads, and WhatsApp. TikTok is a short-form video hosting service owned by Byte Dance, a Chinese internet technology company operating a range of content platforms. As alluded to earlier, social media platforms are on the rise. Companies are exploring how to utilize these platforms outside of their initial purpose of simply sharing personal lives by brainstorming business uses such as product advertising, influencer marketing, customer behavioral patterns, information tracking, and more. Table 3 shows the massive scale the industry operates at, and the growth rate continues to rise year-to-year.

Table 3. Social media industry characteristics (Petridis, 2024)

Characteristic	Social Networking
Revenue	\$105 Billion
Profit	\$31.6 Billion
Businesses	23,984

Chapter 3

Research Motivation

This chapter will focus on the relationship between digital platforms and artificial intelligence. It will cover AI advancements within each industry as well as current research and evidence in this space. In addition, it will discuss the purpose of this research and the significant value of exploring the proposed research questions.

AI Advancements in the Streaming Industry

As the streaming industry continues to grow, user demand begins to shift. With the release of new platforms, users want to receive a unique, customizable experience for themselves. Personalization is a widely known challenge in the industry and customers continue to want their user interfaces to be tailored to their interests. The release of generative AI technology provides companies with the assets to set themselves up for success and address customer needs. Generative AI's capabilities to track user information, provide data insights, and improve personalization fit perfectly to satisfy this increasing want. Platforms have begun the process of introducing new features to enhance the customer experience and offer their customers a unique value proposition. This section will primarily explore Spotify along with a brief overview on a few other platforms.

Spotify, like many other music streaming platforms, has taken advantage of using AI to create a better listening experience for users. Features include an AI DJ feature, AI language translation for podcasts, and AI-suggested recommendations (Kaput, 2024). The Spotify AI DJ is a new feature where an AI-powered DJ will create a music queue based on your personal tastes

and previous listening habits. In fact, it specializes in the user experience by having a realistic narrator state what is coming up in the queue. It switches up the queue based on real-time feedback when the user hits the DJ button creating a more personalized experience with each listen. In addition, Spotify's Discover Weekly has a series of custom playlists crafted at the beginning of each week based on preferences and the AI algorithm. It exposes users to new music based on listening history allowing them to expand their music library through new artists and genres. This is similar to a recently launched feature called Daylists offering users AI-generated playlists with oddly specific, unique titles (for example, mountain music on a Thursday evening or country love songs red dirt afternoon). In 2023, Spotify announced language translation for podcasts, allowing users to translate the host's original voice into their desired language. It is a growing feature that helps broaden the reach of podcasters to outside their traditional audiences. Spotify Wrapped, one of their most popular features, is where users receive a personalized summary of their listening patterns throughout the year.

Spotify's impressive list of AI features aligns with their decade pattern of acquiring companies in the AI space. Their most recent AI-related acquisition was Sonantic which uses AI to convert text to speech. Other acquisitions include Tunigo, Echo Nest, Seed Scientific, Sonalytic, Niland, and Machine Learning Day (refer to Table 4).

Table 4. Spotify AI-related acquisitions (Kaput, 2024)

Year	Company	Purpose of Acquisition
2013	Tunigo	Power better music recommendation algorithms
2014	Echo Nest	Music intelligence company used to improve recommendations
2015	Seed Scientific	Data science company
2017	Sonalytic	Machine learning to detect audio and recommend music
2017	Niland	AI startup to optimize music searches and recommendations

Similar trends are seen across different platforms such as Apple Music and Amazon Music. Apple Music’s Personalized Radio or Discovery Station are examples of AI features to help maintain their competitive position against Spotify. Many of the streaming platforms are acquiring AI companies to assist in the transition (refer to Table 5).

Table 5. Music streaming platforms’ AI-related acquisitions

Platform	Latest Acquisition	Purpose
Spotify	Sonantic	Converts text to speech
Apple Music	AI Music	Generates tailor-made music
Amazon Music	Snackable AI	Enhances podcast features

AI advancements are revolutionizing the streaming industry through customizing user experience and improving content recommendation. Algorithms analyze user history to offer personalized suggestions about content as well as playlist generation. AI integration has an external focus on improving backend processes to increase value for users who consume content on streaming platforms.

AI Advancements in the Social Media Industry

Like the streaming industry, generative AI’s capabilities can be leveraged in social media for content generation and personalized user experiences. This section will discuss unique features across social media platforms. Facebook’s and TikTok’s AI features are centered around internal usage and their AI-powered virtual assistants, Meta AI, and TikTok Creative Assistant.

Facebook uses AI to moderate content and enhance user experiences. As per the Facebook Help Center, the app uses an AI algorithm to moderate content that goes against community standards. Their custom machine learning models analyze photos and text posts to identify if a post contains graphic content and begins the content review process. This may include removing it from the platform or forwarding it to the human review team for additional review. The intention of Meta AI is to create a relationship with the user, help them find information at a convenience and connect with people around them. Features include having conversations with users, customer support, and automation of tasks (booking appointments, making reservations, and more) (Refer to Figure 3). Additional AI-related features include face recognition, ad targeting, and language translation.

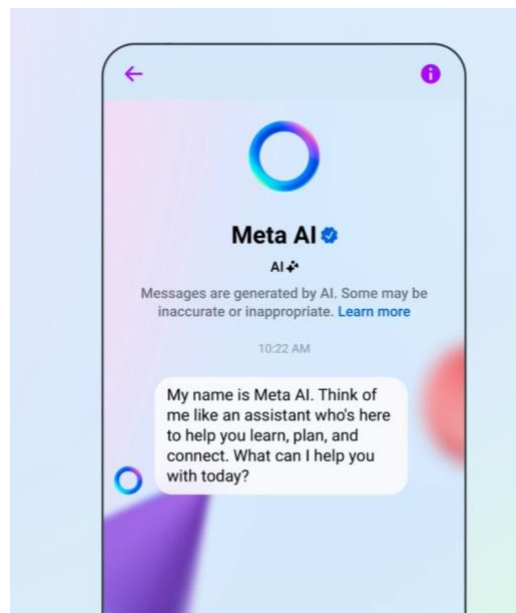


Figure 3. Facebook's AI-powered virtual assistant: Meta AI (Vermes, 2023)

TikTok's For You Page (FYP) is a classic example of an AI-curated feed based on user interests, preferences, and prior activity. The app tracks user interactions with videos such as likes, comments, saves, shares, and reposts. The algorithm uses this information to create a

personalized feed with content that specifically relates to the users. This works in conjunction with another AI feature, the app's ability to use natural language process to analyze video content (captions, hashtags, and audio) to create more accurate and targeted feeds for users. Additional AI tools range from effects, filters, to editing features. There is a large offering of live effects and augmented reality filters that allow users to apply fun features to their live streams and videos during filming to create a more engaging video. Editing features include video stabilization, smart trimming, and intelligent transition effects creating a user-friendly experience to polish their videos.

Similar trends are seen across different platforms such as Snapchat and Instagram. Snapchat Plus subscribers can use the app's AI button to type a prompt and generate images based on the text (refer to Figure 4). Like Facebook, as both are subsidiaries of Meta Platforms Inc, Instagram uses AI features to moderate content and users can change backgrounds of Instagram stories with a prompt using the "Backdrop" feature.

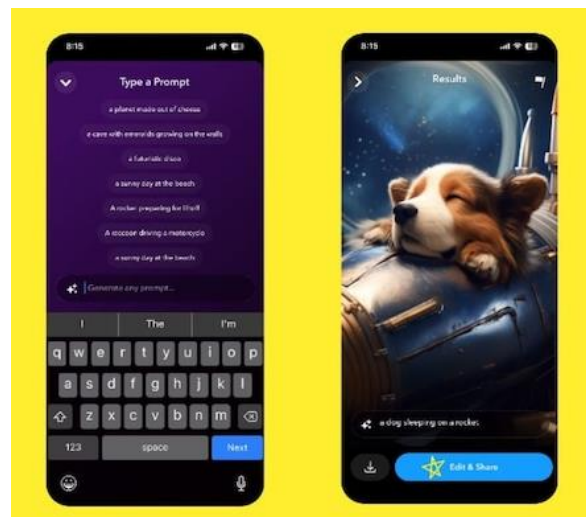


Figure 4. Snapchat Plus AI tool (Castro, 2023)

AI advancements are transforming the social media industry through enhancing user experiences, content moderation, targeted advertising, and data analysis. Algorithms allow for

better data tracking and editing tools to produce content more effectively on the platform. Real-time analysis features provide valuable insights on post optimization, engagement stats, and audience demographics. The AI features have an internal focus for users who generate content on social media platforms.

Importance and Value of Customer Reviews

Customer reviews started as a simple star rating and now 98% of people read online reviews for businesses (Paget, 2024). 91% of 18–34-year-old customers trust online reviews as much as personal recommendations. Reviews can help create a perception of your business before the customer has experienced the good or service provided. Customers expect businesses to have a Google rating of 3.84 across a minimum of 20 reviews to garner a sense of trust (Williams, 2019). There is potential to grow a business through positive reviews. In fact, businesses have understood the importance of reviews which may have led to an increased generation of fake reviews to boost online perception. The National Bureau of Economic Research released research discussing the impact of fake reviews on economic welfare and concluded to curb the impact on consumer behavior and demand, companies must share educational resources on how to identify fake reviews.

With the growth of social media, customer reviews are proof that a product works and increases customer trust in your business. In addition, it has the power to increase awareness and visibility for your brand. Most customers use reviews for purchase decisions, and it can build immense social capital for the company. A prime example of this is BeReal, a social media app that encourages users to be authentic and post themselves when a notification was released

during a random time of day. The app currently has an average rating of 4.8 out of 5 across 987,000 reviews and its rise to fame was a product of shining reviews from the app's users. An app with a higher number of reviews and 4-star average rating can signify to a user the popularity of the platform and the perceived quality of the app. Customer reviews can also be used as an advance index for future downloads signaling to the company their competitive advantages and improvements to better their platforms. Given the significance of customer reviews for a business, it can reveal how innovative technologies can impact the perception of a platform's features. By evaluating customer reviews, the goal is to identify trends of integrating generative AI features from a user's perspective.

Theoretical Foundation and Research Objectives

Provided the untapped potential of AI advancement and the monetary value of generative AI integration, it is crucial to understand historic patterns and market trends to invest in such a technology. AI is making its presence across many industries, and the introduction of generative AI technology in the digital realm is increasing the opportunity to innovate. Current research in this space is limited as businesses are in their trial-and-error phases in understanding how to best approach generative AI. This increases the need and value of this research to investigate current movements and the way to move forward in this new space.

As mentioned in the earlier chapters, trends in streaming and social media along with success factors prompt a proactive response to such disruptions in the industry. Digital platforms, in the streaming and social media industry, have begun testing out different AI features to improve the user experience. The fast-paced technology is requiring companies to stay ahead of

the curve or fall behind. It sparks a need to examine how a growing technology can be used in everyday operations for platforms used daily. As per a Forbes article, businesses are moving away from process orientation and toward platform orientation. This is done by focusing on customizing the user experience. The success factor is identifying and catering to your stakeholders. Everest Group, a management consulting firm, refers to the “ACT” acronym: anticipate, complete, timely. Platforms need to anticipate user needs, provide user transactions that are a complete experience, and satisfy user needs in a timely fashion (Samuel, 2019). AI can be an enabler to predict what customers need and how their past interactions with the company may dictate future actions and purchases. This provides insight into how generative AI has currently been implemented and can be implemented.

The emergence of AI has been successfully adapted across platforms; however, it is not perfect. In the healthcare industry, generative AI is used for drug development, cancer diagnosis, and day-to-day medical tasks such as wellness checks (Minevich, 2023). However, there have been many failed cases. Zillow, an online real estate marketplace, purchased homes at a higher price than the company’s estimate of future selling prices creating a \$304 million inventory write-down for quarter 3 in 2021. Similar trends are present in larger companies such as Amazon where its AI-powered recruiting software heavily preferred male candidates (Olavsrud, 2023). These failed cases are bound to happen when entering and taking risks with innovative technologies. The use cases serve as a guiding light on how to proceed and conduct a thorough analysis prior to adapting generative AI. This research intends to understand the impact of generative AI on digital platforms in the streaming and social media industry through the sentiment of customer reviews.

Chapter 4

Methodology and Results

This chapter will discuss the data sets used, the methods to conduct the analysis, and relevant findings. First, I will describe the data collection procedures. Second, a preliminary data analysis is conducted to acquire evidence in terms of trends and comparison. Third, I conduct an empirical analysis to demonstrate the impact of generative AI launch on the customer reviews for the focal platforms in pre and post AI periods. Finally, I will interpret the results and provide key findings that will be used in the following chapter.

Datasets

These datasets were publicly available on Kaggle, an online data science community. For this thesis, I chose three datasets containing information about customer reviews for the different platforms (details included in Table 6). The selection requirement for the datasets was that reviews should be available before and after the launch of generative AI platforms, identified as the release of ChatGPT by OpenAI on November 30th, 2022. Periods before November 2022 are defined as pre-AI sessions and periods after November 2022 are defined as post-AI sessions.

Table 6. Datasets

Dataset	Platform	Time Span
3.4 million Spotify Google Store reviews	Spotify	05/26/2014 – 11/14/2023
4.1 million Facebook Google Store reviews	Facebook	11/17/2021 – 11/11/2023
3.5 million TikTok LITE Google Store reviews	TikTok	08/15/2020 – 11/13/2023

Method 1: Exploratory Data Analysis

For the preliminary data analysis, summary statistics and sentiment scores were generated using RapidMiner. The purpose of generating summary statistics (mean and standard deviation) was to gain an overview of the average review ratings in pre-AI and post-AI periods. The goal for sentiment analysis was to understand the overall sentiment score pre-AI and post-AI launch. It is calculated using natural language processing techniques to identify tone and emotions expressed in language and report a score. The sentiment score provides a high-level understanding of whether customer reviews were positive or negative during a specific period.

There were three steps in the process including retrieving data (Step 1), filtering data based on the timestamp of the review (Step 2) and extracting the sentiment (Step 3). For each data set, there were two-iterations to signify pre-AI (timestamp < 11/30/2022) and post-AI (timestamp >= 11/30/2022). In the results tab of RapidMiner, summary statistics and sentiment scores were available.

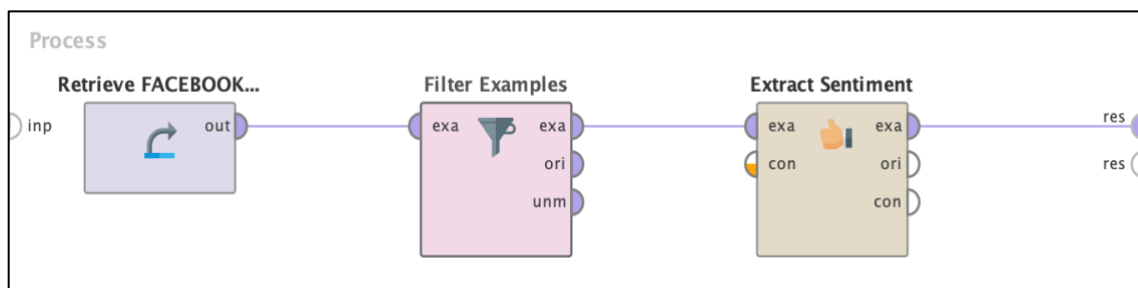


Figure 5. RapidMiner method (summary statistics and sentiment analysis)

Method 2: Empirical Analysis

For the statistical analysis, Stata was used to clean data and run regressions. The purpose of statistical testing is to understand the differences between the control (August 2021 – January

2022) and treatment groups (August 2022 – January 2023). The regression helps capture any correlation between variables observed in the dataset and can help understand the effect of a dependent variable on an independent variable. In the analysis settings, I used a difference-in-differences approach. There were multiple steps followed in the process including cleaning up data (Step 1), transforming the data (Step 2), generating variables (Step 3), and running regressions (Step 4).

To clean and transform the data, any data outside the control and treatment group time periods was dropped to prevent any confounding effects. This included data prior to 08/01/2021, in the range of 02/01/2022 – 07/31/2022, and post 02/01/2023. To ensure an accurate regression, the timestamp variable had to be formatted to follow the YMD (Year, Month, Date) format. Following this, additional variables were created. Table 7 lists the generated variables:

Table 7. Data transformation in Stata

Variable	Type	Description
Timestamp	String	The original timestamp variable was transformed to YMD format.
Post_AI	Binary	Any data between on or after 11/30/2022 is considered post-AI hence has a value of Post_AI = 1.
Treat	Binary	Any data between 08/01/2022 – 01/31/2023 is in the treatment group hence has a value of Treat = 1. <i>This meant any data outside of this range was in the control group hence has a value of Treat = 0.</i>
AI_Effect	Binary	Any data between 11/30/2022 – 01/31/2023 is in the treatment group AND Post-AI period hence has a value of AI_effect = 1. <i>AI_Effect = Treat * Post_AI</i>

Once the data was cleaned and transformed, the goal was to estimate the following two equations and run regressions.

$$\gamma (\text{Review_rating}) = \beta_0 + \beta_1 \times \chi_1(\text{Post_AI}) + \varepsilon \quad (1)$$

$$\gamma (\text{Review_rating}) = \beta_0 + \beta_1 \times \chi_1(\text{Post_AI}) + \beta_2 \chi_2(\text{AI_Effect}) + \varepsilon \quad (2)$$

Results: Impact of Artificial Intelligence on the (Music) Streaming Industry

This section will focus on the results generated for Spotify using the methods covered earlier. Spotify was used as a tool to investigate broader trends in the streaming industry.

Table 8. Spotify descriptive statistics

Variable	Type	Mean	Std. Dev	Min	Max	# of Obs
Pre_AI	Binary	0.7200	0.4490	0	1	456,900
Post_AI	Binary	0.1360	0.3430	0	1	456,900
Treat	Binary	0.3780	0.4850	0	1	456,900
AI_Effect	Binary	0.1360	0.3430	0	1	456,900

Table 8 shows the descriptive statistics for generated variables in the Spotify data set, calculated through the summarize command on Stata.

Table 9. Spotify summary statistics and sentiment scores

Spotify				
Pre-AI		Post-AI		Difference
Review Rating (Average)	4.2340	Review Rating (Average)	2.9160	1.3180
Sentiment Score (Average)	0.6130	Sentiment Score (Average)	0.2780	0.3350

Table 9 shows the results from the sentiment analysis. Pre-AI has a higher review rating of 4.234 compared to the lower post-AI rating of 2.916. Furthermore, the sentiment score for

pre-AI is 0.335 points higher compared to the post-AI scores. This may signify an overall higher positive sentiment generated during the pre-AI period.

Table 10. Results for review rating (Spotify)

Variable	Equation 1	Equation 2
	<i>Treat</i>	<i>Treat & AI_Effect</i>
<i>Post_AI</i>	-0.0930* (0.0057)	-0.0202* (0.0082)
<i>AI_Effect</i>		-0.1210* (0.0099)
Constant	3.9640* (0.0029)	3.9640* (0.0029)
R-squared	0.0007	0.0011
Number of observations	389,360	389,360

*Standard errors are reported in parentheses. * indicates significance at the 95% level.*

The regression on Equation 1 included review rating as the y-variable and post-AI as the x-variable. In the pre-AI group (post-AI = 0), the review rating is 3.9640. In the post-AI group (post-AI = 1), the review rating is expected to decrease by 0.0930 points. The AI effect relates to comparing the control and treatment group pre and post AI launch, signifying that the launch of AI has a negative effect in the post-AI period.

The regression on Equation 2 included review rating as the y-variable and post-AI and AI effect as the x-variables. In the post-AI group (post-AI = 1), the review rating is expected to decrease by 0.0202 points. If the interaction variable was 1 (AI effect = 1), meaning the data is in the treatment group and the post-AI period, the review rating is expected to decrease by 0.1210 points.

Spotify has heavily leveraged AI from content curation to customized user experiences. While their review rating and sentiment score decreased in the post-AI period, it is not conclusive to state the cause of this is AI integration. The review ratings remained similar for

both regressions at 3.95, a high rating. In fact, based on certain reviews, the positive ratings frequently state new AI features in the customer reviews (refer to Table 11).

Table 11. Examples of Spotify review texts and rating (AI features)

Review text	Rating
I enjoy the awesome UI of this app, and it has all the music one can ask for.	5
Easy to search and discover new music and also fast enough to not give you a headache. I cannot complain.	5
I use this app every single day and I enjoy the wrapped at the end of every year...	3

Results: Impact of Artificial Intelligence of the Social Media Industry

This section will focus on the results generated for Facebook and TikTok using the methods covered earlier. These two platforms were used too as a tool to investigate broader trends in the social media industry. The first section will focus on Facebook.

Table 12. Facebook descriptive statistics

Variable	Type	Mean	Std. Dev	Min	Max	# of Obs
Pre_AI	Binary	0.8820	0.3230	0	1	1,462,106
Post_AI	Binary	0.0970	0.2960	0	1	1,462,106
Treat	Binary	0.3580	0.4790	0	1	1,462,106
AI_Effect	Binary	0.0970	0.2960	0	1	1,462,106

Table 12 shows the descriptive statistics for generated variables in the Facebook data set, calculated through the summarize command on Stata.

Table 13. Facebook summary statistics and sentiment scores

Facebook				
Pre-AI		Post-AI		Difference
Review Rating (Average)	3.4130	Review Rating (Average)	2.6350	0.7780
Sentiment Score (Average)	0.1450	Sentiment Score (Average)	0.0940	0.0510

Table 13 shows the results from the sentiment analysis. Pre-AI has a higher review rating of 3.413 compared to the lower post-AI rating of 2.635. In addition, the sentiment score for pre-AI is 0.051 points higher compared to the post-AI scores. This may signify an overall higher positive sentiment generated during the pre-AI period.

Table 14. Results for review rating (Facebook)

Variable	Equation 1	Equation 2
	<i>Treat</i>	<i>Treat & AI_Effect</i>
<i>Post_AI</i>	0.0816* (0.0037)	0.00842* (0.0050)
<i>AI_Effect</i>		-0.0053* (0.0055)
<i>Constant</i>	3.5670* (0.0016)	3.5670* (0.0016)
R-squared	0.0003	0.0003
Number of observations	1,459,500	1,459,500

*Standard errors are reported in parentheses. * indicates significance at the 95% level.*

The regression on Equation 1 included review rating as the y-variable and post-AI as the x-variable. In the pre-AI group (post-AI = 0), the review rating is 3.567. In the post-AI group (post-AI = 1), the review rating is expected to increase by 0.0816 points. After the launch of AI, there is a negative effect in the treatment group.

The regression on Equation 2 included review rating as the y-variable and post-AI and AI effect as the x-variable. In the post-AI group (post-AI = 0), the review rating is 3.5670. In the post-AI group (post-AI = 1), the review rating is expected to increase by 0.0084 points. If the interaction variable was 1 (AI effect = 1), meaning the data is in the treatment group and the post-AI period, the review rating is expected to decrease by 0.0053 points.

This next section will focus on TikTok.

Table 15. TikTok descriptive statistics

Variable	Type	Mean	Std. Dev	Min	Max	# of Obs
Pre_AI	Binary	0.8610	0.3460	0	1	1,018,694
Post_AI	Binary	0.1410	0.3480	0	1	1,018,694
Treat	Binary	0.4220	0.4940	0	1	1,018,694
AI_Effect	Binary	0.1410	0.3480	0	1	1,018,694

Table 15 shows the descriptive statistics for generated variables in the TikTok data set, calculated through the summarize command on Stata.

Table 16. TikTok summary statistics and sentiment scores

TikTok				
Pre-AI		Post-AI		Difference
Review Rating (Average)	4.3290	Review Rating (Average)	4.1160	0.2130
Sentiment Score (Average)	0.4780	Sentiment Score (Average)	0.4460	0.0320

Table 16 shows the results from the sentiment analysis. Pre-AI has a higher review rating of 4.329 compared to the lower post-AI rating of 4.116. In addition, the sentiment score for pre-

AI is 0.032 points higher compared to the post-AI scores. This may signify an overall higher positive sentiment generated during the pre-AI period.

Table 17. Results for review rating (TikTok)

	Equation 1	Equation 2
Variable	<i>Treat</i>	<i>Treat & AI_Effect</i>
<i>Post_AI</i>	-0.0723* (0.0033)	0.0760* (0.0048)*
<i>AI_Effect</i>		-0.2470* (0.0058)
<i>Constant</i>	4.3080* (0.0016)	4.3080* (0.0016)
R-squared	0.0005	0.0022
Number of observations	1,018,694	1,018,694

*Standard errors are reported in parentheses. * indicates significance at the 95% level.*

The regression on Equation 1 included review rating as the y-variable and post-AI as the x-variable. In the pre-AI group (post-AI = 0), the review rating is 4.308. In the post-AI group (post-AI = 1), the review rating is expected to decrease by 0.723 points.

The regression on Equation 2 included review rating as the y-variable and post-AI and AI effect as the x-variable. In the post-AI group (post-AI = 1), the review rating is 4.308. In the post-AI group (post-AI = 1), the review rating is expected to increase by 0.0760 points. If the interaction variable was 1 (AI effect = 1), meaning the data is in the treatment group and the post-AI period, the review rating is expected to decrease by 0.247 points.

Facebook and TikTok saw similar review ratings across the regressions. Facebook's data analysis showed a positive slope coefficient for the treatment indicating an increase in review ratings in the post-AI period. TikTok had the highest review rating across all platforms with a 4.34/5.00. While there is a decrease in review ratings and sentiment scores in post-AI periods, the AI features focused on those users who generate content versus those who consume content.

Key Insights

Based on this analysis, the decreased review ratings identified in post-AI periods may be due to a hesitancy of companies to integrate AI features since it is a modern technology. Adoption of AI comes with benefits and drawbacks, and conducting an extensive review of ethical and legal implications for all stakeholders requires investment of important resources. For Spotify, many of the negative reviews discussed ads which were a result of a free Spotify account versus a premium subscription. For Facebook, negative reviews referred to scams and bugs. TikTok had the highest rating amongst the three platforms due to its positive reviews relating to the app's unique offerings. From a customer perspective and existing research, there may be value of generative AI integration in terms of personalization, content moderation, and media curation. The analysis through these three different platforms leads to indications of broader industry trends. Spotify's investments in AI show that users crave more personalized experiences based on their listening history from their selected streaming platforms. Facebook and TikTok reveal the future direction of social media platforms in terms of the way users produce content.

This aligns with what generative AI has demonstrated it can do and through introducing new features, there can be a boost in review ratings for these platforms. For example, generative AI can allow personalization of user experiences in a quick, efficient manner. However, to do so, it requires tracking of data and feeding the model personal information about a user leading to the rules and regulations within the AI industry. Companies need to adhere to the legal environment and establish strict procedures around protecting data, promoting privacy, and creating ethical practices. Assuming it is done correctly, generative AI can successfully create a safe personalized experience promoting better review ratings. This is applicable to many other

generative AI features and understanding the kaleidoscope of complex factors that are components of integration will be a challenging yet rewarding space to navigate. The next section will explore this further.

Chapter 5

Discussion

This chapter will focus on the trends mentioned earlier with relation to generative AI use in the streaming and social media industry. The streaming industry focuses on generative AI integration from a user consumption perspective whereas social media focuses on the content generation perspective. Both focus on several aspects of the overall user experience.

Theoretical Evaluation of Generative AI Integration on Digital Platforms

Generative AI integration will be explored through consumption and generation perspectives. User consumption refers to the set of users who are consuming content on digital platforms, the audience of those who produce content. Content generation relates to individuals who want to produce different forms of content across digital platforms. They value the variety and useability of editing tools. Depending on the digital platform, it may serve either, or both purposes. For example, Spotify is primarily serving content consumers as they are sourcing their content (music) from artists. On the other hand, apps such as TikTok serve both. Users can determine how they want to use the app and their unique algorithm allows enjoyable consumption of content while encouraging users to take advantage of producing content through popular sounds, short-length videos, and monetary incentives such as the creator fund. For many influencers, TikTok has served as a stepping stone for their rise to fame. That said, AI integration does not follow a one-size-fits-all model for all companies hence it is important to understand the company's value proposition before investing in the latest technology.

Practical Implementations of Generative AI Integration on Digital Platforms

This thesis emphasizes the importance of further research and investment in generative AI technology. It provides a foundation of concepts that are shifting the conversation towards generative AI. It is evident that this is a new space, and companies can choose to be reactive or proactive with the uncertainty surrounding the technology. A reactive approach may include waiting to see how competitors respond, risking the chance to take advantage of being an early adopter. Alternatively, being proactive can have benefits across multiple areas. An early investment in generative AI technology can establish companies as top players in an industry and a high-quality experience will speak for itself, having a domino effect in external perception and financial returns. The research gives companies a starting toolkit to begin their navigation in this space. These findings prove value in generative AI integration and companies can determine what that transformation may look like for their respective company.

Chapter 6

Conclusion

Based on the research, there is value of generative AI integration across different digital platforms to enhance the holistic user experience. Through analysis of three digital platforms, Spotify, Facebook, and TikTok, this research has understood industry trends for streaming and social media. Furthermore, it examines the impact of generative AI integration through review ratings and sentiment scores of customers across the platforms. The datasets were used to explore industry trends and the selected platforms are top players in the industry providing a reasonable representation of what constitutes success. As a result, streaming and social media digital platforms can get ahead of the curve by adopting generative AI technology.

The research identifies the value of generative AI integration generated through a better user experience and increased efficiency of backend operations resulting in financial benefits for the company. As seen with top players in each industry, there is value in outsourcing the resources to begin an AI-friendly transformation. Many companies have been exploring this space for years and leveraging experts will prevent unnecessary exhaustion of resources or reinventing the wheel. Acquisitions can serve as a great starting point to fill in gaps of in-house talent and begin the process of integration. Ideally, this will have a domino effect on how features are integrated strategically, either from a consumption of generation perspective, or both. Moving ahead, companies can explore uses of generative AI for endless opportunities from improving internal processes to providing the highest quality of goods and services.

The limitation of this research lies in several aspects. First, this study focuses only on the publicly available information regarding customer reviews and sentiments for different digital platforms. Access to detailed company data will provide more up-to-date information to run a

more accurate analysis of changes in customer behavior in pre-AI and post-AI periods. Second, three platforms were used to uncover trends in the streaming and social media industry. There are several types of digital platforms not covered, especially considering the size and diversity within the two industries. Finally, the r-squared for the regressions run are too small. This indicates that the independent variable in the model can only explain a small part of variation in the dependent variable. While the results are statistically significant, the economic significance needs investigation. This research serves as an introduction to digital platforms navigating the generative AI space however, it is not entirely exhaustive in nature hence, further exploration will add more value.

Appendix

```
clear

*Step 1: Import csv data into Stata*
import delimited "/Users/maansishah/Desktop/Thesis/Data/SPOTIFY_REVIEWS.csv"

*Step 2: Clean up data*
*2.1 Convert review_timestamp from string to numeric; Format to date format**
generate timestamp1 = substr(review_timestamp, 1, 10)
generate timestamp2 = substr(timestamp1, "-", "/", 2)
generate timestamp3 = date(timestamp2, "YMD", 2300)
format timestamp3 %td
*GENERATE NEW TIMESTAMP - N/A*

*2.2 Drop Data*
drop if inrange((timestamp3), mdy(1,1,2014), mdy(7,31,2021))
drop if inrange((timestamp3), mdy(2,1,2022), mdy(7,31,2022))
drop if inrange((timestamp3), mdy(2,1,2023), mdy(1,1,2024))

*Step 3: Pre and Post AI*
*Pre-AI: BEFORE NOV 30 2022*
generate pre_AI = 0
replace pre_AI = 1 if inrange((timestamp3), mdy(1,1,2014), mdy(11,30,2022))

*Post-AI: AFTER NOV 30 2022*
generate post_AI = 0
replace post_AI = 1 if inrange((timestamp3), mdy(11,30,2022), mdy(1,1,2024))
replace post_AI = 1 if inrange((timestamp3), mdy(11,30,2021), mdy(1,1,2022))

*Step 3: Generate Variables*
*3.1 Treat = 0 (Control) and Treat = 1 (Treatment)*
*Control: August 2021 - January 2022*
*Treatment: August 2022 - January 2023*
generate treat = 0
replace treat = 1 if inrange((timestamp3), mdy(8,1,2022), mdy(1,31,2023))

*3.2 Interaction Term*
generate AI_effect = post_AI*treat

*Step 4: Regress*
summarize review_rating if treat==0
summarize review_rating if treat==1

regress review_rating post_AI
regress review_rating post_AI AI_effect
```

Figure A1. Stata do code file

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