Journal of Information Systems Engineering and Management
2025, 10(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Utilizing Big Data Analysis to Drive Digital Commerce: Insights from Amazon's Model

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ARTICLE INFO

Received: 13 Feb 2025

Revised: 14 Apr 2025

Accepted: 28 Apr 2025

ABSTRACT

This study aims to highlight the significance of big data processing and its role in facilitating digital commerce, mainly through Amazon's digital platform. By analyzing data and statistics, we clarify the precise meaning of digital commerce, which relies on analyzing vast customer data alongside other digital technologies. Amazon's evolution from an online bookstore to a digital commerce giant has driven by its commitment to customer satisfaction, utilizing technology and big data collection and analysis. As a result, Amazon has distinguished itself with key attributes that have contributed to the widespread growth of digital commerce across various competitive sectors.

Keywords: Big Data, Digital Commerce, Amazon's sales share in the markets, Market share of Amazon, Amazon Web Services Revenue

***JEL Classification**: O390, F23,*

Introduction

Many countries and institutions have increasingly adopted digital technology across all sectors and industries, aligning with modern and international business models as traditional models are no longer adequate to meet current advancements. The recent COVID-19 pandemic has underscored the urgency of accelerating digital transformation, as the need for social distancing and remote work became critical to controlling the spread of infection. This shift has been facilitated by digital transformation tools, particularly in commerce, which has evolved from electronic to fully digital. Operating in this new digital environment and adopting modern business models have led to significant changes in many concepts and products, including the emergence of digital goods and the growing volume of digital assets for companies. This transformation is largely driven by big data analysis, which involves collecting vast amounts of data based on a company's focus, and then analyzing it to study markets, customers, and competitors.....

In 2001, Doug Laney introduced the widely accepted definition of big data, which is based on the "big data trilogy": volume, velocity, and variety. Volume refers to the quantity of data, variety to the different types of data, and velocity to the speed at which data is processed. Big data enables companies to maximize the use of both historical and real-time data generated from supply chains, manufacturing processes, and customer behaviors. Businesses that effectively leverage big data are more likely to

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experience increased innovation and improved financial performance. This advantage allows companies to outperform their competitors. (liver , Laura, & Rajini , February 2016), a "big" data set refers to a vast collection of data that can be captured, communicated, aggregated, stored, and analyzed. The phenomenon of big data is driven by an increasing number of sources, including internet clicks, mobile transactions, user-generated content, social media, and deliberately generated data such as customer information and purchase transactions collected by sensor networks. While there is no single definition for big data, it generally refers to the accumulation of data from both traditional and digital sources, inside and outside an organization, leading to large volumes that can only be analyzed on a large scale. Big data is characterized by volume, variety, velocity, integrity, and value, setting it apart from traditional data used in analytics. In recent years, business-related big data has grown exponentially in the e-commerce industry. Data warehouses now store vast amounts of information (volume), while the variety of technologies generating data is expanding rapidly due to the Internet of Things (IoT). Big data also encompasses the massive amounts of information generated by social media platforms every second, such as Twitter messages, emails, videos, and Facebook content. As millions of users upload data daily, the volume of data continues to grow at an accelerating pace. (Grace, 2023)

Advancements in big data analysis have significantly contributed to the evolution of e-commerce into digital commerce. Digital commerce refers to the exchange of goods, services, and information over digital networks, encompassing a wide range of online activities, including buying and selling. This can involve physical products, such as clothing or electronics, as well as digital products, like software or music. Transactions occur through electronic platforms or mobile applications, which often allow consumers to browse product lists, add items to virtual shopping carts, and proceed to secure payment via electronic gateways. In the past, digital commerce was relatively limited due to technological constraints and restricted internet access, along with emerging e-commerce platforms,so "digital commerce is all international commerce that is ordered and/or delivered digitally." (International Monetary Fund, the Organisation for Economic Co-operation, 2023), digital ordered commerce is defined as: The international sale or purchase of a good or service, conducted over computer networks using methods specifically designed to receive or place orders. Digitally delivered commerce is defined as: International transactions delivered remotely in electronic format, using computer networks specifically designed for this purpose. (OECD, 2021)

With advancements in information technology, the widespread use of the internet, and improvements in digital infrastructure, the landscape of digital commerce has changed significantly. There has been a remarkable expansion in digital commerce, driven by technological progress in data infrastructure networks and the global increase in mobile device usage. These devices enable seamless global connectivity, facilitating transactions for all parties involved. This has allowed companies to reach a worldwide customer base, while consumers can access a wide range of products and services from anywhere at any time. The growth of digital commerce platforms has transformed traditional commerce, opening new opportunities for digital businesses. Digital commerce has become a powerful force, reshaping traditional business models and offering vast potential for innovative strategies. In this context, the importance of big data in driving digital commerce on platforms like Amazon will be explored

Research Problem

The problem of the study lies in knowing the extent to which the analysis of big data and the support of the Amazon platform contribute to the transformation of e-commerce into digital commerce, which considered a change that has challenges, if this company can move forward.

Research Focus

The study aims to:

- Identify the nature and importance of big data and its analytics.

- Identify the elements of big data analytics and the tools for handling and using them.

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- Understand the qualitative and necessary quantities of big data to improve the quality and success of digital commerce.

- Identify the most important mechanisms for the development of Amazon's digital platform.***Research Aim and Research Questions***

The study attempts to answer the following questions:

- What is big data?

- What is the difference between e-commerce and digital commerce?

- Does big data play a role in the development of digital commerce on the Amazon platform?

1-Literature Review

Text of the Literature Review (Cambria, font size 11 pt, justified). Theoretical analysis should not be limited by references to authors who studied the raised issue. It should contain a brief summary of received data with the allocation of directions, trends, approaches to the problem. It is not allowed to list names of scientists! It is characterized by presenting a careful bibliographic review of at least 50 references.

The description of empirical results should contain specific data confirming the statistical accuracy of obtained results. They can be presented in the form of tables, graphs, diagrams with further interpretation. Most of the sources should reflect the current state of scientific research (5 recent years).

The theoretical framework will establish the theories on which the study is based. The literature review will establish the most relevant investigations of the object of study. Check all references in the text and list provided, because after adjusting the APA 7 style correctly, there will be some changes:

– indicate general trends in what has already been published (and describe how this problem and issue is being addressed in other countries!);

– point out conflicts in theory, methodology, practice, or research findings that you have reviewed;

– point out scientific gaps or strengths in research in other countries.

1.1: Study of (siddharth , K.T. , Siddharth, & K.T. , April 2023.)

This study focused on the fact that digital marketing is the trend that is sweeping the world in this era of automation. With online marketing concepts evolving into a major platform for digital marketing, along with electronic devices such as digital billboards, mobile phones, tablets, smartphones, gaming devices, and many other devices, the trend of digital marketing is increasing daily. Amazon has proven the power of online marketing by forming a niche market of online stores that compete with traditional stores. The current study examines Amazon.com's adoption of various digital and online marketing techniques to dominate the digital marketing field. The current study also examines Amazon's tremendous success in online marketing due to its introduction of new ideas. Within a few years, it will be clear that digital marketing has largely replaced traditional marketing. Many marketers will put digital marketing at the top of their list of priorities, and may look for creative methods of online marketing, lowering the cost per lead, increasing click-through and conversion rates, and knowing what is trending in the field.

The study found that customers can save money and valuable time by doing business online. The purpose of any great company is to provide creative solutions to the problems of the public. Being aware of how to differentiate between value and excellence will enable you to be a more creative employee, company owner, and contributor. Amazon has all the essential requirements to top the list of successful e-commerce companies worldwide. It is crucial in helping online commerce grow to become more popular than ever before. Future developments will see Amazon's influence grow due to the rapid development in the world, especially in e-commerce.

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1.2: Study of (Gold Nmesoma , Zainab , Uneku , Chioma , & Ejuma , January 2024)

The burgeoning field of big data analytics has revolutionized the marketing landscape, offering unprecedented opportunities for personalized marketing campaigns. This review aims to focus on the current state of knowledge on leveraging big data for personalized marketing, and to outline the objectives, methodologies, key findings, and conclusions drawn from recent research in this area. The primary objective of this review is to explore how big data analytics can be effectively used to customize marketing strategies to individual consumer preferences, behaviors, and patterns. Methodologically, the review takes a comprehensive approach, examining a wide range of studies that use different big data tools and techniques, including machine learning algorithms, data mining, and predictive analytics, in the context of personalized marketing. Big data has emerged as a pivotal tool in understanding and predicting consumer behavior. By leveraging massive data sets, companies can gain deeper insights into consumer preferences and behaviors, enabling them to design their marketing strategies more effectively. Studies have shown that big data analytics significantly enhances marketers' ability to accurately segment markets and target consumers with personalized messages. This not only improves customer engagement and satisfaction but also increases the efficiency and effectiveness of marketing campaigns. The review also highlighted the importance of various big data tools and platforms in marketing. Tools such as Apache Hadoop, Apache Spark, and cloud computing technologies have been instrumental in processing and analyzing large amounts of data. These technologies enable marketers to efficiently handle complex data sets, providing valuable insights for strategic decision-making. Moreover, the advent of artificial intelligence and machine learning has added a new dimension to big data analytics, providing more sophisticated ways to analyze and interpret data. However, the use of big data in marketing is not without its challenges. Privacy and ethical concerns come to the forefront, as companies need to strike a delicate balance between leveraging consumer data and respecting individual privacy. Studies suggest that transparency, ethical oversight, and adherence to data protection regulations are crucial in maintaining consumer trust and avoiding backlash. Additionally, implementing big data strategies involves overcoming various challenges, including security issues, data management complexities, and the need for technological expertise. Case studies and practical applications of big data in marketing provide real-world examples of how companies have successfully leveraged big data to enhance their marketing strategies. These case studies provide valuable lessons and best practices, such as the importance of digital transformation, effective data management, and customer relationship management. They also highlight the potential of big data in niche markets and specific consumer segments.

Looking ahead, emerging technologies are expected to have a significant impact on big data marketing. The continued evolution of digital technologies and the increasing availability of diverse data sources will drive changes in consumer behavior. Big data marketing strategies will need to adapt by utilizing advanced analytics techniques, focusing on niche markets, and predicting future consumer trends. As consumer behavior continues to evolve, big data marketing strategies will play a critical role in helping companies stay competitive and meet changing consumer needs.

Key findings suggest that big data analytics significantly enhances marketers' ability to understand and predict consumer behavior, leading to more effective targeting and segmentation strategies. The integration of big data has shown improvement, and big data has become an indispensable part of modern marketing strategies. Its ability to provide deep insights into consumer behavior and market trends has transformed the marketing landscape. As the field continues to evolve, businesses must keep up with the latest developments and adapt their strategies accordingly. By effectively leveraging big data analytics, businesses can boost customer engagement, improve marketing efficiency, and achieve greater success in the marketplace. However, they must also be mindful of the ethical implications and challenges associated with big data and strive to use it responsibly and transparently. The future of big data in marketing is bright, with emerging technologies providing new opportunities for innovation and growth.

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1.3: Study of (David , et al., February 2024)

This study provides a comprehensive review of the latest trends in AI-powered predictive analytics in the retail sector and explores innovative customer engagement strategies that leverage these advanced technologies. The review begins by clarifying the basic concepts of AI and predictive analytics, highlighting their synergistic role in predicting consumer behavior, demand patterns, and market trends. The paper then delves into emerging trends, such as machine learning algorithms, natural language processing, and computer vision, that are revolutionizing the way retailers leverage data to make strategic decisions. In addition to identifying technological advances, the paper emphasizes the critical role of data quality and ethical considerations in implementing AI-powered predictive analytics. The paper addresses challenges related to privacy concerns, algorithmic bias, and the need for transparent AI models to ensure responsible and fair use of customer data. Furthermore, the paper explores a range of customer engagement strategies enabled by AI-powered predictive analytics. From personalized shopping experiences and targeted marketing campaigns to dynamic pricing and inventory optimization, retailers are deploying innovative approaches to boost customer satisfaction and loyalty. The review also discusses case studies of successful AI applications in leading retail organizations, demonstrating tangible benefits such as improved operational efficiency, increased sales, and enhanced customer retention.

These real-world examples illustrate the transformative impact of AI-powered predictive analytics on diverse aspects of the retail value chain. By examining emerging trends and customer engagement strategies, they serve as a valuable resource for industry professionals, researchers, and policymakers seeking to navigate the evolving AI landscape in retail. Examining successful case studies has reinforced the practical impact of AI applications, from enhancing customer engagement through personalized recommendations (Amazon, Netflix, Spotify) to breakthroughs in healthcare diagnostics (IBM Watson) and autonomous driving (Tesla). These real-world examples underscore the diversity of AI applications and the tangible benefits experienced by organizations that have embraced these technologies. AI-powered predictive analytics is not just a technology trend but a strategic imperative for retailers navigating the complexities of the modern marketplace. The ability to extract actionable insights, personalize customer experiences, and drive operational efficiency positions AI as the driving force behind the future of retail. As organizations continue to evolve their strategies, staying attuned to emerging trends and ethical considerations will be essential to harnessing the full potential of AI and creating lasting, meaningful connections with customers in an increasingly dynamic, data-driven retail landscape.

1.4: Study of (Osato I, Bankole, Kelechi , & Uneku, January 2024.)

This study explores the strategic use of big data in fast-moving consumer goods (FMCG) supply chains, highlighting the approaches taken by U.S. companies and potential applications for the evolving African market. As technology transforms the supply chain management landscape, U.S. companies are at the forefront of leveraging big data analytics to improve efficiency, enhance visibility, and respond dynamically to consumer demand. The analysis delves into specific strategies used by U.S. FMCG companies, ranging from predictive analytics to forecast demand to real-time tracking to optimize logistics. Furthermore, the study examines the adaptability and relevance of these strategies to the unique challenges and opportunities presented by the African market. Exploring successful case studies, challenges, and potential solutions provides valuable insights for both U.S. companies seeking to expand into Africa and local companies aiming to harness the power of big data to improve their FMCG supply chain management.

The findings contribute to the ongoing conversation about the intersection of technology, global supply chains, and the transformative potential of big data in shaping the future of FMCG distribution across continents. The study Big Data in FMCG Supply Chains, with a focus on US companies' strategies and their applications to the African market, underscores the transformative potential of data-driven approaches in shaping the future of supply chain management. Big data has emerged as a catalyst for

innovation, redefining the way FMCG companies operate, improve operations, and navigate the complexities of global markets.

1.5: Study of (Donald , et al., December 2023)

This paper critically examines the role of big data in shaping contemporary business strategies, highlighting its transformative impact across sectors. The study delves into the multifaceted nature of big data, exploring its integration into business models, the challenges it poses, and the strategic benefits it offers. The research is based on a comprehensive literature review, focusing on peer-reviewed articles, conference papers, and academic book chapters from 2010 onwards, ensuring relevance and novelty in the rapidly evolving field of big open data. The aim of this paper is to provide a nuanced understanding of how big data impacts business strategies, identify existing research gaps, and set a clear direction for future scholarly inquiry. The scope includes an assessment of the integration of big data into business strategies, its impact on decision-making processes, ethical implications, and the effectiveness of existing technologies and methodologies. Key findings reveal that big data significantly enhances decision-making capabilities, customer experience, and competitive advantage.

It also highlights the need for a strategic blueprint for big data integration, addressing cultural, governance, strategic, and technological aspects. The study concludes with recommendations for companies to adopt a data-driven approach, integrating big data analytics into their strategic planning to enhance decision-making, customer engagement, and ethical compliance. Finally, the paper emphasizes the need for companies to develop comprehensive strategies for integrating big data, with a focus on fostering a data-driven culture and ensuring data security and privacy. This strategic approach will enable companies to harness the full potential of big data, drive innovation, and maintain a competitive advantage in the digital landscape.

1.6: Study of (Weiqing , 31 October 2021)

The study focuses on the relative influence of theoretical research and practical activities of big data analytics in e-commerce to explain the differences between the United States and China according to the two major databases, Web of Science and CNKI, respectively, and by using other samples that present e-commerce retail sales and the number of some data companies established in the United States and China each year. We also identify the reasons for the difference between the United States and China in big data analytics in e-commerce, which can help managers develop appropriate business strategies in each country's e-commerce, and provide evidence of the significant relationship between theoretical research and practical activities in big data analytics in e-commerce. In addition, the variables related to big data companies show a moderating effect rather than a mediating effect on the practice of theoretical research in e-commerce in the United States, but show a moderate effect and mediating effects in China. The results of this study help clarify doubts about the development of e-commerce in China. Furthermore, three trends in e-commerce using big data analysis and the use of quantum computing in e-commerce are explored to solve current e-commerce problems to provide better evidence for decision-making that can be valuable in future research. The rapid growth of e-commerce has benefited not only from the development of data science over the past two decades but also from the explosion of big data from various sources. This is why China and the United States are the largest e-commerce markets and why China accounts for more than the United States in e-commerce sales. Finally, we can identify the reasons for the difference between the United States and China on this point. One reason is the institutional differences and commercial value, which makes the Chinese society's perception of BDA in e-commerce more acceptable than that of the United States. Another reason involves the theoretical research work on BDA in e-commerce in China, which has attracted slightly more extensive attention than that observed in the United States and included a comparison of literature databases, indicating that a significant relationship between theoretical research and practical activities in BDA in e-commerce can be demonstrated. In addition, in the United States, in terms of the relationship of putting theoretical research into practice, the data company variables show a moderate effect but no mediating effect. However, in China, the mediating effects of

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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this relationship have been explained. These results help clarify the doubts about the development of e-commerce in China, which even exceeds the United States today, in light of the theoretical and practical comparison of big data analysis in e-commerce between them.

2 - Big Data and Digital Amazon

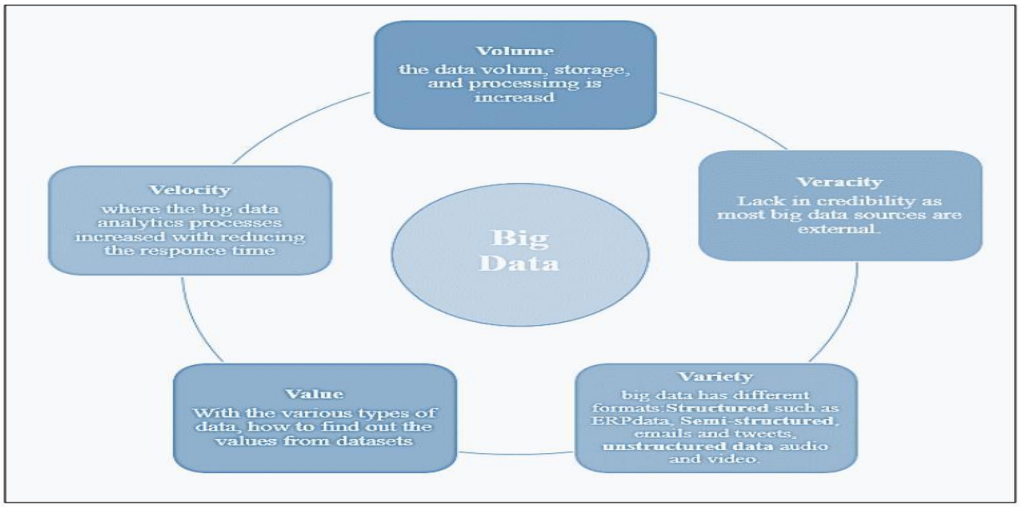
2.1 - The mechanism of collecting big data in Amazon:

Amazon provides the infrastructure for using and analyzing big data for other companies through the AP service. AP makes it easy for companies to build applications that can provide a variety of personalized experiences, such as specific product recommendations, personalized product classifications, and personalized direct marketing. AP is a fully managed machine learning service that trains, tunes, and deploys customized machine learning models that go beyond rigid rule-based recommendation systems to provide personalized recommendations to customers in industries such as retail, media, and entertainment. (Ali & Shivam, Chapter June 2022)

The company uses predictive analytics for targeted marketing, which in turn increases customer satisfaction and loyalty. It does this through: (https://iide.co/case-studies/business-model-of-amazon/, 2024)

a. Personalized recommendation system: Amazon pioneered the use of a specific program to customize personalized recommendations for consumers. It is called the Collaborative Filter Engine (CFE). The company generally adheres to the principles of behavioral analytics. It drives 35% of Amazon's annual online store sales. The CFE works as a system by analyzing customer purchasing patterns from recent purchases, wish list items, and items saved in the shopping cart. It also extracts information from products that have been reviewed and rated by the consumer as well as the most searched products. All this information trains the CFE algorithm to make better predictions about what the user likes and dislikes. It will even recommend additional and relevant purchases to customers. For example, if you buy a dog leash, it may recommend a collar or a dog tag.

Figure 2 Big Data in Terms of the 5 V's.



Source : (Grace, 2023)

Figure 2 illustrates the five dimensions of big data—volume, velocity, variety, reliability, and value. It captures the essential characteristics of big data and provides a framework for understanding the challenges and opportunities associated with processing and analyzing large, complex data sets and how these five dimensions interact with each other. So, in simple terms, big data is about handling massive amounts of data that come in quickly and in many different forms, ensuring that it is reliable, and using it to find valuable insights. Big data is used in digital commerce to collect and analyze data

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2025, 10(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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about customers, products, and transactions to make data-driven decisions that can improve business operations and the customer experience.

B. Predictive Shipping Model: We all know that Amazon is famous for its fast delivery times. Now, Amazon customers can get same-day delivery delivered to their doorstep within five hours. This is possible through Amazon's proprietary predictive delivery model. Amazon uses consumer data to predict what they will buy and when. It then estimates when they will need it. The predicted items are then shipped to a warehouse specified by the consumer's location so that they are ready for delivery when the user orders them.

C. Alexa: While Alexa is the classic virtual assistant, Amazon also offers additional virtual assistants like the Echo and Echo Show. All of these products include speakers and/or a camera. These are used for a variety of purposes such as getting weather alerts, news updates, or even ordering cat food. This is far from a simple voice command. However, what many of us don't realize is that our voice commands are being recorded. These voice recordings are taken and uploaded to Amazon's servers. Amazon explains that it helps train speech recognition to be more effective. However, for many customers, this quickly becomes a privacy concern. Amazon stores the order information and uses it to predict future purchases for that particular user. These will then be suggested on the Echo home screen.

. D. One-Click Ordering: There are millions of alternatives available to Amazon, and the company knows it. With all this competition, Amazon needs a competitive strategy to keep consumers on its platform. That's why it started using One-Click Ordering. It's a patented feature that allows customers to automatically purchase anything without having to constantly enter shipping and billing information. This feature is enabled when a user places their first order and enters shipping and payment information. If they choose One-Click Ordering, they have 30 minutes to decide on a future purchase. After that, the product is automatically charged and shipped based on the user's information. 5. Kindle Highlighting Book Recommendations: When Amazon acquired Goodreads in 2013, it brought a social networking service with over 25 million users. It integrated its Kindle platform with this audience and launched all new features to help integrate its products. After purchasing, users can highlight words and share them with others. Amazon saw a gold mine of data. It started monitoring highlighted words in the Kindle app. In this way, Kindle began to gather more information about readers' interest. In turn, this data was used more to recommend e-books to its customers.

2.2: How Amazon's digital commerce platform works:

Amazon is the largest digital commerce platform in the world and provides an excellent opportunity for sellers to reach a wide audience of buyers and increase their sales. Here is a comprehensive guide to digital commerce on the Amazon platform:

-The first step to start selling on Amazon is to create a seller account. There are two types of seller accounts on Amazon:

-Individual seller account: Suitable for individuals who want to sell small quantities of products.

-Professional seller account: Suitable for companies and sellers who want to sell large quantities of products.

-It is important to choose products with high demand and low competition.

-Make sure to optimize your product listings using relevant keywords, high-quality images, and informative descriptions.

-It is important to set a competitive price for your products, taking into account the cost of goods sold and the desired profit margin.

-You can either ship your products yourself or use the Fulfillment by Amazon (FBA) service.

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e-ISSN: 2468-4376
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-FBA is a convenient option for sellers as Amazon takes care of storing, shipping, and customer service for your orders.

-Marketing on Amazon: Marketing is essential to the success of any business on Amazon. Here are some of the most important marketing strategies you can use on Amazon:

-Optimize your product listings:

-Use relevant keywords in your product titles, descriptions, and bullets.

-Upload high-quality images that show your products from different angles.

-Use Amazon's search engine optimization tools to improve the visibility of your product listings.

-Amazon Ads: Use Amazon Ads to reach a wide audience of potential buyers. You can target your ads using relevant keywords, customer interests, and behaviors.

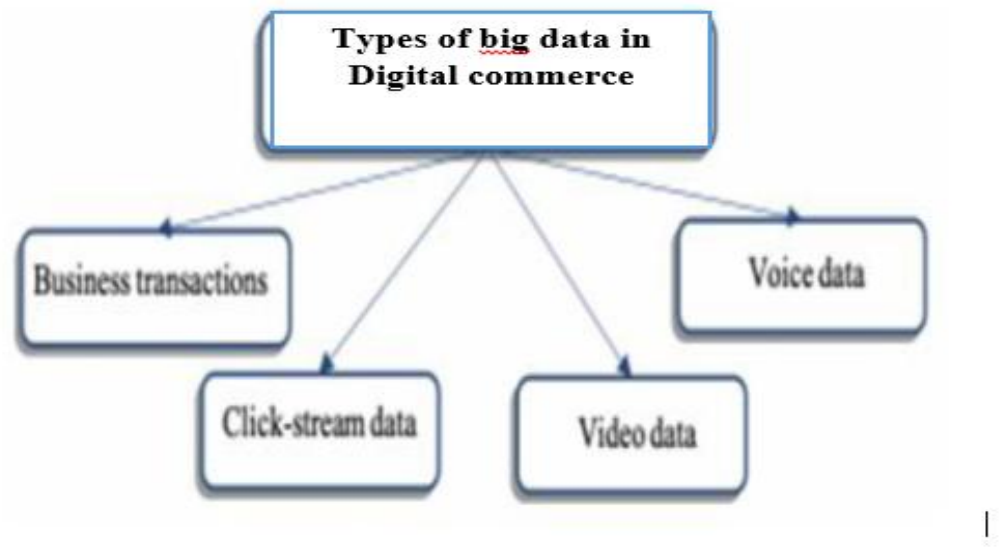
-Discount offers and promotions: Use discounts and promotions to attract buyers and increase sales. You can create discount offers on specific products, product groups, or at specific times of the year.

-Content marketing: Create engaging content related to your products such as blog posts, videos, and photos Infographics. Share content on social media and other relevant forums.

-Influencer Marketing: Collaborate with influencers to promote your products to their audience. Influencers can help build brand trust and credibility and increase sales.

-Email Marketing: Collect email addresses from customers and subscribers to your email list and then send emails.

FigureN 3 :Types of big data in Digital commerce



Source :(Grace, 2023)

The types of big data used in e-commerce are illustrated in Figure 3; one can see that big data in Digital -commerce is a valuable resource that allows businesses to extract meaningful insights from various data sources such as business transactions, clickstream data, audio data, and video data. By analyzing and interpreting this data, digital commerce businesses can make informed decisions, improve customer experiences, optimize operations, and drive business growth.

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2.3: Big Data Processing Technologies in Amazon Digital Company

Amazon relies on a variety of advanced technologies to process the massive amounts of big data it collects from various sources, including:

a-Big Data Processing Platforms:

Amazon Elastic MapReduce (EMR) is a cloud service that allows big data processing applications such as Apache Hadoop and Apache Spark to run on a large scale.

Amazon Kinesis: is a cloud service for processing streaming data in real time, such as website activity data or Internet of Things sensor data.

Amazon Redshift: is a cloud data warehouse designed to analyze large data sets quickly and efficiently.

Amazon Athena: is a cloud service that allows Amazon S3 data to be analyzed using the SQL query language.

Amazon Glue: is a cloud service that helps prepare, transform, and clean data before analyzing it.

b- Data Analysis Tools:

Amazon QuickSight: is a cloud service for creating interactive dashboards and reports from data.

Amazon SageMaker: It is a cloud platform for machine learning and developing artificial intelligence models.

Amazon Machine Learning: It is a cloud service that allows building and running machine learning models without the need for programming experience.

c-Artificial Intelligence Technologies:

Machine Learning: Amazon uses machine learning to analyze data, predict trends, and make decisions.

Deep Learning: Amazon uses deep learning to develop more complex and accurate artificial intelligence models.

Natural Language Processing: Amazon uses natural language processing to understand, index, and analyze unstructured data, such as text and images.

d-Other Technologies:

Distributed Databases: Amazon uses distributed databases to store big data on a wide range of servers.

Hybrid Cloud Computing: Amazon uses a mix of public and private cloud computing to process big data.

Edge Computing: Amazon uses edge computing to process data close to its source, reducing latency and improving processing efficiency.

These technologies help Amazon to:

Better understand customer behavior: By analyzing customer data, Amazon can better understand their needs and preferences, allowing it to provide more relevant shopping experiences.

Improve its operations: Amazon can use data to improve its supply chain, logistics, and other operations, leading to increased efficiency and reduced costs.

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Develop new products and services: Amazon can use data to develop new products and services that better meet customer needs.

Gain a competitive advantage: Big data processing technologies help Amazon gain a competitive advantage over other companies in e-commerce and many other areas.

2.4: Advantages of Amazon's use of big data:

For companies like Amazon and many others, the amount of data collected regularly is overwhelming. To manage and process large amounts of data, Amazon leverages big data technology to do the work for them. Essentially, big data collects every click, like, comment, and transaction. It's what has allowed an entire industry to be built on massive stores of information) :https://iide.co/case-studies/business-model-of-amazon(2024 ،/

a. Supply chain optimization: Amazon uses supply chain optimization. To fulfill orders quickly, Amazon communicates with manufacturers and uses data to track their inventory. It also uses big data to determine the closest warehouse to the customer to reduce overall shipping costs.

b. Price optimization Prices are determined based on user activity on the site, competitor prices, product availability, expected profit margin, and more. Prices change roughly every ten minutes as big data is processed and costs are updated. In total, this has boosted Amazon's profits by 25%.

c. Additional purchases per order: Big data is the primary driver of Amazon's product recommendations, but it also collects information. Amazon uses this information by predicting what users will want to buy as additions to their existing purchases. This data encourages customers to make impulse purchases, which of course increases Amazon's profits.

d- Keep you scrolling: Using big data, Amazon can serve you content that keeps you engaged on the platform. Using your purchase history, what you click on, and reviews, Amazon compiles a personalized product feed for its users. The goal of providing personalized recommendations to you is to increase the likelihood that you will buy a product or engage with content. They do this across all of their products. From Amazon's online store to Prime Video, the longer they can keep your attention, the more money they can make. (https://www.invisibly.com/learn-blog/how-amazon-uses-big-data/, 2024)

3-Statistical indicators on the growth of Amazon's digital commerce

3.1: Amazon's Dominance in digitale-commerce:

Amazon's dominance in the e-commerce market, which has extended to digital retail, is highlighted by three main sections of the data in the form of the following numbers:

a: The e-commerce empire (in a pie chart): Amazon represents 49.1% of digital retail sales in the United States, where Amazon is about to acquire 50% of digital retail sales in the United States, showing Amazon represents 5% of total retail sales in the United States, and total digital retail sales in the United States: $ 252 billion, while the other major players: eBay (6.6%), Apple (3.9%), Walmart (3.7%).

b: The second chart shows the top 5 public companies in terms of e-commerce sales (2016-2018): Amazon's market share grew from 38% in 2016 to 49% in 2018. Other companies featured are eBay, Apple, Walmart, and Home Depot. Amazon's growth is described as "rapid" compared to the "surprisingly flat US market." Third: The third chart shows Amazon Prime's global sales growth from 2015 to 2018 as follows: In 2015: Sales were estimated at $0.9 billion, in 2016 $1.5 billion (up 69%), in 2017 $2.4 billion (up 59%), and in 2018 $4.2 billion (up 74%). Prime sales growth in 2018 lasted for 36 hours, compared to 30 hours in 2017. 2017.

These data show Amazon's significant and growing dominance in the digital commerce sector, especially in the US market. They also show the rapid growth of Amazon's Prime Day sales event,

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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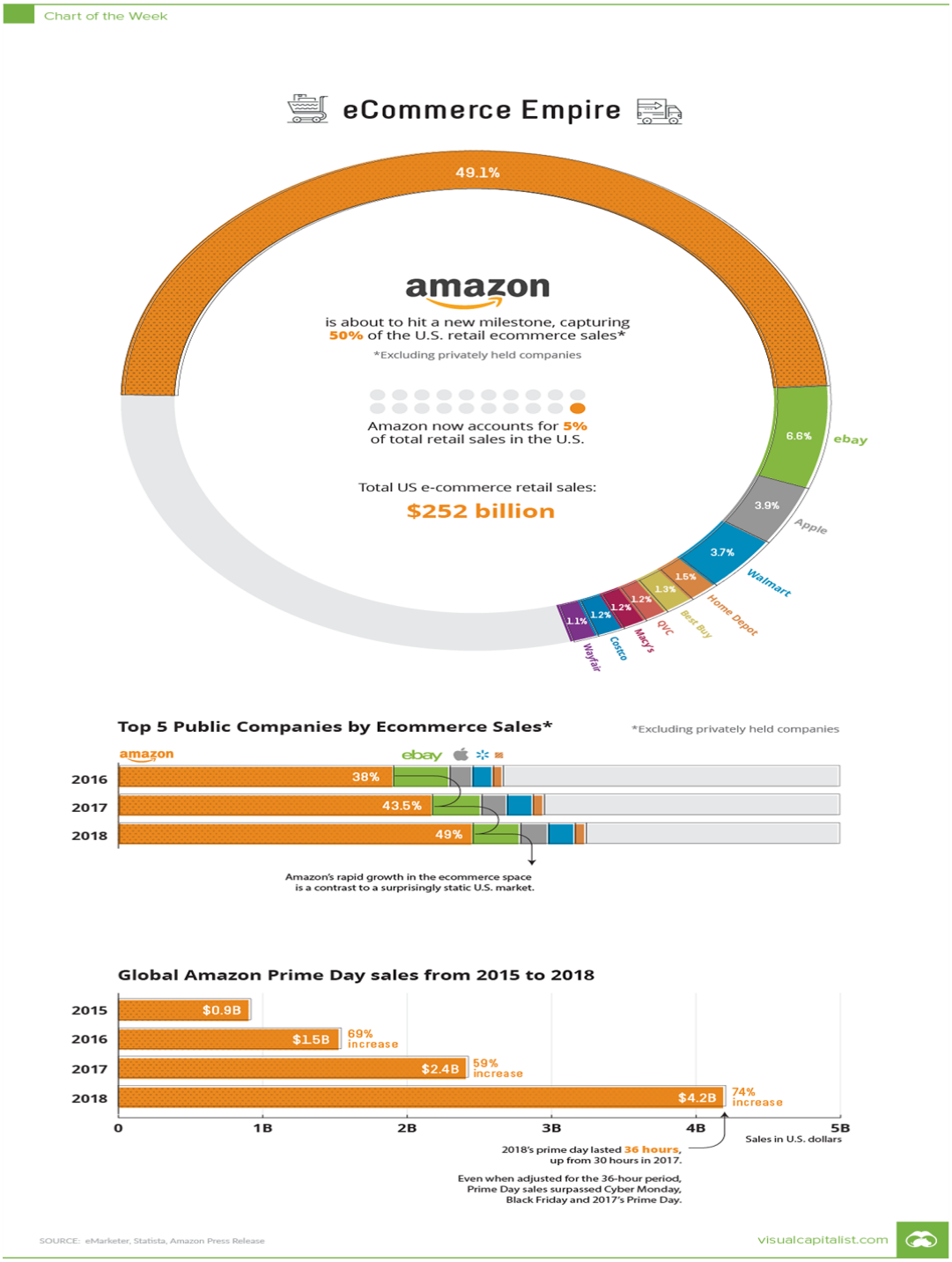
indicating the company's ability to create and expand new revenue streams within the digital commerce space. "FigureN04"

FigureN04:Amazon's Dominance in digitale-commerce:2016-2018



Source : (https://www.visualcapitalist.com/chart-shows-amazons-dominance-ecommerce/#, 2024)

3.2: The development of Amazon's sales share in the markets

Amazon's total net sales have grown significantly, from about $100 billion in 2014 to nearly $600 billion in 2023, as shown in "Figure 5". This represents a growth of nearly 500% over a decade,

Journal of Information Systems Engineering and Management
2025, 10(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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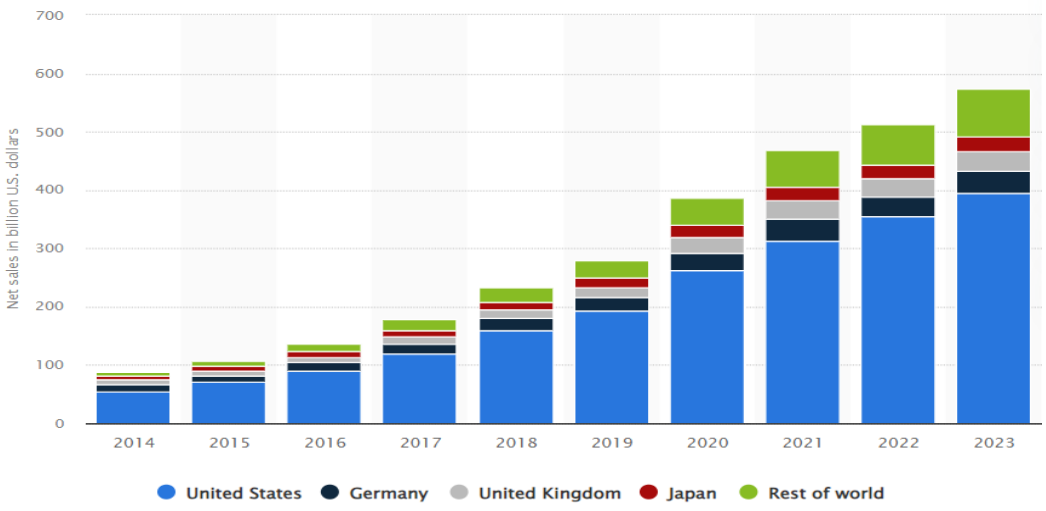
indicating Amazon's strong expansion into the market and increasing its dominance in e-commerce, digital commerce, and other sectors.

The United States remains Amazon's largest market during this period, with U.S. sales rising from about $50 billion in 2014 to about $400 billion in 2023, an increase of 800%. The U.S. market share of Amazon's total sales has also increased over time, indicating continued strong domestic growth despite international expansion.

While Germany, the UK and Japan are key international markets, they are showing steady growth, albeit at a slower pace than the US. By 2023, Germany looks set to become the second largest market, followed by the UK and Japan. The Rest of World category has seen significant growth, particularly from 2020 onwards, indicating successful expansion into new markets and increased global presence. Amazon's growth reflects the broader trend towards digital transformation in retail and other sectors. The company's expansion has significant implications for local economies, potentially disrupting traditional retail while creating new opportunities in logistics and cloud computing. The data shows that Amazon's global expansion strategy is working, with the US market driving the majority of growth. The company's ability to sustain high growth rates over a decade demonstrates its ability to adapt and continually shift towards e-commerce. However, the varying growth rates across markets also highlight the challenges and opportunities in international expansion.

FigureN05: Amazon's annual net sales in selected leading markets from 2014 to 2023



Source : (https://www.statista.com/statistics/672782/net-sales-of-amazon-leading-markets/, 2024)

3.3: Market share of Amazon-branded products

The market share of various Amazon-branded products as of 2019 is shown in Figure 6. AmazonBasics, which focuses on home goods and electronics, has a large market share of 57.8%. This indicates Amazon's success in penetrating everyday consumer goods and leveraging its platform to promote its brand. The high market share also indicates economies of scale, allowing Amazon to offer competitive prices and potentially higher profit margins.

The "Other Brands" category accounts for 19% of the market share. This indicates Amazon's strategy of diversifying and maintaining a portfolio of brands to meet the needs of different market segments or product categories. It also shows room for growth and expansion in different areas.

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e-ISSN: 2468-4376
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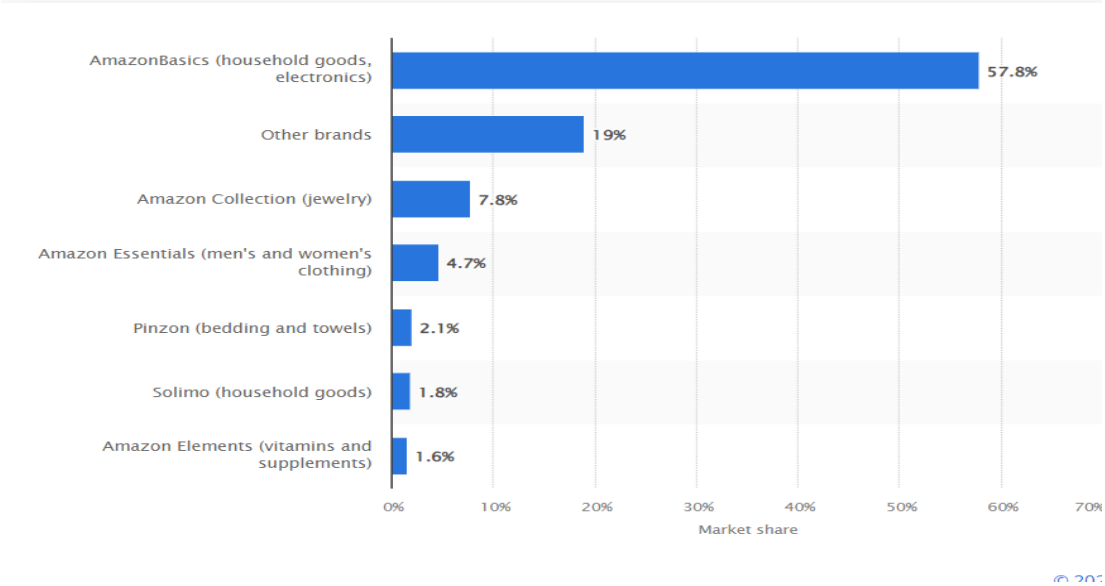
The relatively high share of jewelry (7.8%) indicates Amazon's successful entry into higher-value discretionary purchase categories. This diversity in luxury goods demonstrates Amazon's ability to compete in markets beyond everyday necessities.

Amazon Essentials - Apparel (4.7%), despite its small size, represents Amazon's push into the highly competitive fashion retail sector, and can be seen as a strategic move to capture a share of the lucrative apparel market and build customer loyalty.

Pinzon (bedding and towels, 2.1%), Solimo (home goods, 1.8%), and Amazon Elements (vitamins and supplements, 1.6%) also demonstrate Amazon's strategy of targeting specific product areas. These smaller market shares indicate Amazon's experimentation with different product categories, which may determine future growth areas.

These data thus reveal Amazon's successful strategy of leveraging its platform to promote its brands across different categories. AmazonBasics' dominance and presence in diverse niches demonstrates Amazon's ability to leverage its market position, consumer data, and economies of scale. This strategy has significant implications for competition, consumer choice, and Amazon's long-term profitability and market power.

Figure N. 06: Market share of Amazon branded products as of 2019



Source: (https://www.statista.com/statistics/1019429/global-market-share-amazon-private-label-brands/, 2024)

3.4: Amazon Web Services Revenue

Figure 07 shows the massive growth in AWS revenue over the decade, rising from about $1 billion in Q1 2014 to over $23 billion by Q2 2024. This represents a more than 20-fold increase, indicating rapid expansion and adoption of cloud computing services.

There is a clear upward trend with almost constant growth in each quarter. This indicates strong and sustainable demand for cloud services and AWS's ability to continually expand its market share and offerings.

Growth rate acceleration: The curve is becoming steeper over time, especially from 2017 onwards. This acceleration implies increasing returns to scale and network effects as AWS's infrastructure and customer base grow. Although not as pronounced, there are slight fluctuations that

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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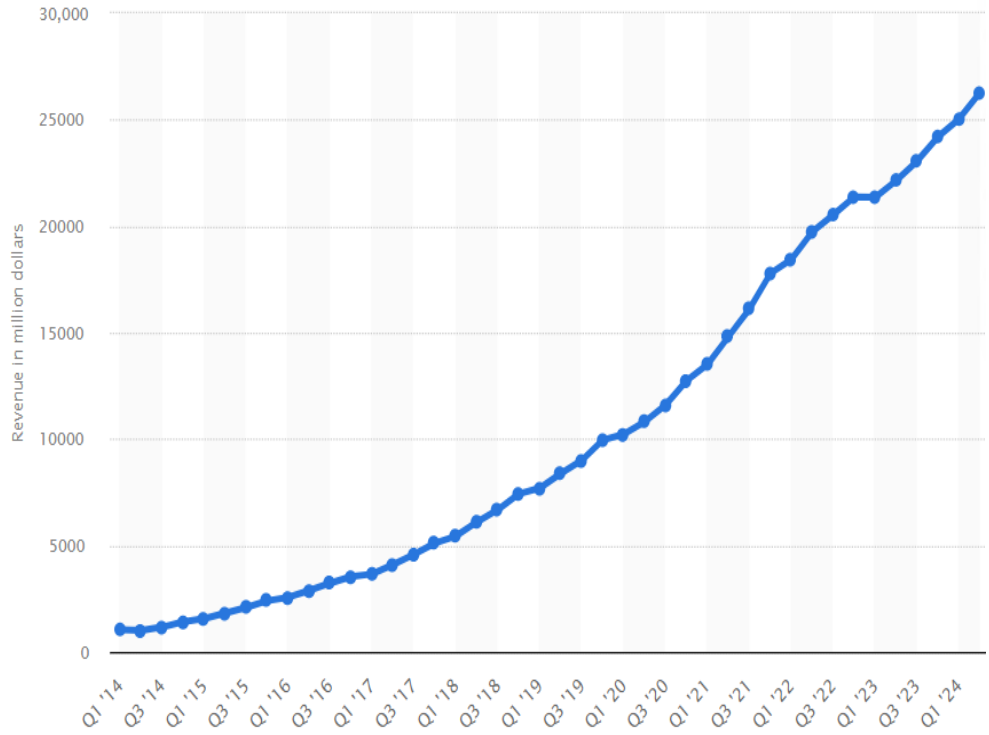
may indicate seasonal patterns in cloud usage, possibly in line with business cycles or end-of-year budget spending by enterprise customers.

Continued growth reflects significant ongoing investment in data centers, networks, and R&D to support its expanding service offerings and customer base. As a leading cloud services company, AWS's growth reflects and drives the global digital transformation, impacting labor markets, business models, and economic productivity across industries. AWS's revenues reflect the explosive growth of cloud computing as a core component of modern business infrastructure, reflecting broader economic trends toward digital transformation, data-driven decision-making, and flexible, scalable IT resources. AWS's sustained growth has significant implications for Amazon's overall business strategy, the competitive dynamics of the technology industry, and the global economy's increasing reliance on cloud-based services.

FigureN07: Amazon Web Services Quarterly Revenue Q1 2014 to Q2 2024



Source : (https://www.statista.com/statistics/250520/forecast-of-amazon-web-services-revenue/, 2024)

Results

Amazon's journey from an online bookstore to a digital commerce giant through its pursuit of customer satisfaction by taking advantage of technology and the mechanism of collecting and analyzing huge data, has led to its distinction with features that have led to the popularity of digital commerce in all its competitive fields, which has made it a preferred destination for online shopping for millions of people around the world, as it has achieved:

-Product diversity: Amazon offers a wide range of products from various categories, including electronics, home appliances, fashion, books, toys, grocery products, and more.

-Competitive prices: Amazon is known for its competitive prices, as it offers offers and discounts periodically, making it an economical choice for purchasing products.

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-Ease of use: The Amazon website and its digital interface are easy to use and navigate, making it easy for customers to find the products they are looking for and make purchases.

-Multiple shipping options: Amazon offers multiple shipping options to suit different customer needs, including free shipping, express delivery, and international shipping.

-Excellent customer service: Amazon is known for its excellent customer service, as it provides 24/7 support through live chat, phone, and email.

-Easy returns: Amazon has an easy return policy that allows customers to return products they don't want or have problems with.

-Security and reliability: Amazon uses advanced technologies to protect customer information and ensure secure transactions.

-Reviews and ratings: Amazon provides a review and rating system that allows customers to read other buyers' opinions about products before purchasing.

-Personal recommendations: Amazon uses artificial intelligence to provide personalized product recommendations to customers based on their purchase history and behavior on the site.

-Continuous innovation: Amazon is known for its continuous innovation, constantly launching new features and services to improve the customer experience.

Amazon's digital platform also faces challenges, including the following:

-Increased competition: Amazon faces strong competition from other e-commerce platforms such as eBay, Alibaba, and Walmart, in addition to traditional retailers that are increasingly moving towards e-commerce.

-Market saturation: Amazon is having difficulty finding new customers in some markets, requiring new ways to attract and retain customers.

- Consumer behavior changes: Consumer expectations are changing rapidly, requiring Amazon to constantly adapt to their needs and preferences, such as customers' desire for more convenient and personalized shopping experiences.

- Compliance with laws and regulations: Amazon is subject to strict regulations in many countries, requiring it to make significant efforts to comply with changing laws and regulations, which can be costly and complex.

-Scrutiny of labor practices: Amazon faces criticism for its labor practices, including working conditions, safety issues, and wages, which can affect its reputation and attract public attention.

-Logistical obstacles: As its business volume increases, Amazon faces logistical challenges in managing its supply chain and fulfilling orders smoothly and efficiently, especially during peak periods such as the holiday season.

- Data security and privacy: Protecting customer data and privacy is a major concern for Amazon, as the company has faced data breaches in the past, which can damage its reputation and lead to large fines.

- Talent Acquisition and Retention: Amazon faces intense competition to attract and retain top talent, particularly in technology and engineering, which could impact its ability to innovate and grow.

-Environmental Sustainability: Amazon faces increasing pressure to address its environmental impact, including carbon emissions, waste, and packaging, requiring significant investments in sustainability practices.

- Legal Challenges: Amazon faces multiple legal challenges, including antitrust lawsuits and government investigations into its business practices, which could impact its business model and profits.

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