To What Extent Has the Introduction of Artificial Intelligence Into the Business Operations of Amazon Provided a Competitive Advantage in the E-commerce Sector?

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1. Introduction

Amazon.com, Inc. (Supporting Document 3), also known as Amazon, is an e-commerce company (Supporting Document 1) run by CEO Andy Jassy (Supporting Document 3). Their mission statement is to be Earth's most customer-centric company (Supporting Document 3). Amazon has been using artificial intelligence (AI) in their operations since the 1990s (Rebelution e-Commerce, 2024). This report will examine newer AI implementations that Amazon has introduced since 2022.

The increasing advancement of AI, especially with robots and generative AI chatbots, plays an important role to fulfill customer needs and provide better customer service. Using AI in a unique way brings Amazon a competitive advantage in the e-commerce sector. The new implementations of AI business operations of distribution, sales and services of Amazon is a change that will affect Amazon's business efficiency and brand, impacting its competitiveness. This leads to the question about the concept of change: To what extent has the introduction of artificial intelligence into the business operations of Amazon provided a competitive advantage in the e-commerce sector?

The research will be done through secondary research. The sources are reliable such as Supporting Document 3, an official document from Amazon. The references provide multiple perspectives such as Document 2, which focuses on the positives of the technology, while Document 4 questions its safety. The documents show a variety of business operations and reveal different perspectives.

2. Analysis and Discussion of Findings

Distribution

Amazon has a newly integrated distribution system called the Sequoia robotic system currently only implemented in Houston since 2023 (Supporting Document 2). It includes 750 000 robots that operate with AI (Dresser, 2023). It includes new technologies such as robotic arms and mobile robots that move inventory (Supporting Document 2). The ergonomic workstations allow workers to work at waist height, limiting repetitive leaning, which may cause health issues over time (Supporting Document 4).

In addition, a SWOT analysis is useful to determine the strengths, weaknesses, opportunities and threats of the business decision regarding the implementation of Sequoia, as seen in Figure 1. The analysis can help to determine whether the new Sequoia system brings a competitive advantage. The change has allowed for the fastest delivery speeds ever recorded in 2023 (Amazon, 2023b), leading to more satisfied customers and a better brand image in the e-commerce sector. Although Amazon themselves reported having more ergonomic systems for employee safety, external reports found otherwise. The increased safety issues negatively affect Amazon's public relations department and brand image, leading to a lower competitive advantage.

Strengths ● Store inventory 75% faster (Dresser, 2023) ● Reduce order process time by 25% (Dresser, 2023) ● Increase same/next-day delivery (2 billion global Q1 2024) (Amazon, 2024) ● Boosting productivity 200-300% (Koetsier, 2022) ● 15% lower reported incidents at robotics sites (Supporting Document 2)	Weakness (Supporting Document 4) ● 6.6% vs 3.2% Amazon to non-Amazon warehouse serious injuries ● Noisy for workers
Opportunities ● Expanding Sequoia to new distribution centres that target new markets	Threats (Supporting Document 4) ● State and federal agencies pursing actions over safety issues ● Skeptics over ergonomic improvements affect image

Figure 1: SWOT Analysis on AI in Distribution and the Sequoia System

Furthermore, many different stakeholders are affected by the Sequoia system, including the managers, government, employees, customers, and shareholders. The managers will be interested in the performance of the robots to decide whether to continue to invest in them. Shareholders are interested in whether their investment is used wisely, which depends on the robots' performance. The government is concerned with the safety issues that the system brings, along with the employees who are concerned about injuries. Finally, the customers are interested in the same-day deliveries that the system brings. The power-interest matrix in Figure 2 allows for categorizing stakeholders to decide which to manage. According to Figure 2, managers should be managed closely, such as Rain Wang, the project manager of Sequoia (Supporting Document 4). The government, shareholders and customers should be satisfied. Those with low power like employees should be informed. Following the

power-interest matrix allows for Amazon to minimize stakeholder conflict to remain competitive and internally stable.

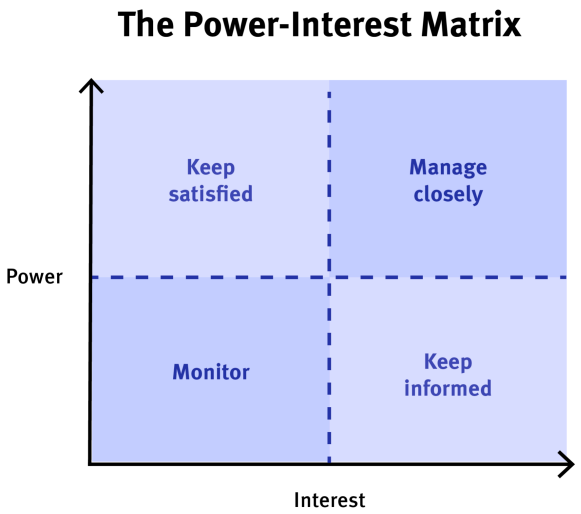

Figure 2: Stakeholder power-interest matrix (Rosala, 2021)

Thus, connecting back to the research question, the introduction of the Sequoia system that operates with the use of AI brings both a competitive advantage and disadvantages into the distribution of Amazon. They are able to offer faster and more efficient distribution with same-day delivery, which provides an advantage over competitors in e-commerce. This pleases the most important stakeholder group—customers—tying into Amazon's mission statement. Although there are slight disadvantages with the safety issues, the new introduction of Sequoia into the distribution system has allowed Amazon to gain a competitive advantage.

Sales

Amazon has newly implemented AI into the business operations of sales. In 2024, Amazon introduced Rufus, an AI shopping assistant, on their website and app. Its features include product recommendations, answering questions and product comparisons. The change was introduced to 10% of US customers, which led to a 0.7%

increase in sales (Amazon, 2024) and 8% increase in navigation engagement (Huang, 2024). The CEO of Amazon, Andy Jassy, said Rufus would "ultimately drive tens of billions of dollars of revenue for Amazon" (Howland, 2024).

On the other hand, while Rufus has brought numerous benefits, there is still controversy surrounding its implementation. Amazon's late entry with a chatbot raises questions on whether they can anticipate and meet customer needs in e-commerce as competitors have had chatbots since the 2010s to early 2020s (Marie Gobiet, 2024). The late entry raises questions about Amazon being customer-centric (Supporting Document 3). Some individuals have said that Rufus lacks the knowledge capabilities of other chatbots (Supporting Document 1).

Additionally, an Ansoff Matrix is useful to plan growth strategies for the use of AI within Amazon that can bring a competitive advantage, as seen in Figure 3. It has market penetration with its new improvements to their AI product recommendations. There is potential for market development by expanding the product recommendations to new markets, which allows for higher customer satisfaction in finding suitable products. This product development of the introduction of Rufus allows Amazon to stay competitive within the e-commerce sector by delivering better customer service at all times. Finally, AI provides the opportunity to diversify and expand to new markets with new products. Bringing Rufus to new markets allows for higher customer satisfaction online and increased customer loyalty. Other diversified products will be discussed more in the *Services* section. This reduces risk as the market is different from Amazon's main target market of buyers in e-commerce.

		Products	
		Existing	**New**
Markets	**Existing**	**Market Penetration** ● Using AI to recommend products to users (Supporting Document 1) ● Search engine recommendations	**Product Development** ● Rufus to answer customer questions ● Rufus available in Canada, France, Germany, India, Italy, Spain, and the UK in 2024 (Supporting Document 3)
	New	**Market Development** ● AI product recommendations in new markets (Supporting Document 3)	**Diversification** ● Expanding Rufus to new countries and markets ● Amazon Bedrock (Amazon, 2023a) ● Amazon Q (Supporting Document 3) ● AI advertising tool to help other businesses ● Project Amelia, AI assistant for sellers with business insights to boost productivity

Figure 3: Ansoff Matrix on AI in Sales

Therefore, the change of the introduction of Rufus and AI into the sales operations of Amazon has provided a competitive advantage overall. Though there is controversy regarding their late addition of a chatbot, Amazon is catching up with the release of Rufus. This has brought improved customer interaction and satisfaction, which increases the chances of customers choosing Amazon over e-commerce competitors. Amazon is able to reach new markets as seen through the Ansoff Matrix, and the diversification brings lower risks.

Services

The introduction of AI into the services operations increases Amazon's competitiveness. Amazon Bedrock, a service that targets businesses in e-commerce, was introduced in April 2023. It allows sellers to build AI applications to generate content or provide better customer service with chatbots (Amazon, 2023a). Its main advantages include scalability for different business sizes, high data security, and ease for business use (Supporting Document 5). It allows for faster processing, personalized shopping, and higher reliability (Supporting Document 5).

Although the user feedback has largely been positive (Donelan, 2024), users have mentioned problems with Titan Embeddings in Bedrock early on, but Amazon has made improvements since then (Schmid, 2023). The source is from a blog, but it represents the opinion of real users. Titan Embeddings is a Bedrock model that transforms text into vectors (Schmid, 2023), which are numerical values used to train AI models (Stehle et al., 2024). There is criticism of the transparency regarding its technical performance and operation, which damages its credibility. It is also found to be inferior to other models like OpenAI's Azure in regard to performance and pricing. Thus, Bedrock can still be improved for better reliability.

Moreover, the positive and negative external factors affecting this new change can be found through a STEEPLE analysis as seen through Figure 4. These external factors can affect Amazon's competitiveness depending on the response to them. The social factors including customer opinion are mainly positive, providing a competitive advantage. Even though there are some negative experiences, Amazon's evaluation of the errors with Bedrock allows them to stay competitive and meet customer expectations. External technological advancements, such as with the development of AI models, create a framework for Amazon to build upon. On the downside, competitors

may have better developments of technology, which decreases the chances that customers will choose to work with Amazon. Though there are times of weak economy, Bedrock's On Demand and Batch allows the customer to pay only for the amount used (Amazon, n.d.-a). Some AI policies may limit the grander potential that Bedrock could be expanded to. However, Bedrock Guardrails are safeguards that block undesirable content that may go against AI policies (Amazon, n.d.-b). If the AI generates negatively-received content, Amazon's image is negatively impacted. Finally, the concerns regarding the privacy of data and how that is used may affect Amazon's image, as this new change raises issues related to its users.

Social	● Largely positive user feedback ● Limited transparency, some negative experiences
Technological	● Technological advancements that Amazon can build on, or may provide a disadvantage if competitors' technology is more advanced ● Model variety such as Anthropic, Cohere, and Meta (Amazon, n.d.-a)
Environmental	● Customer opinion regarding protecting the environment, as AI requires a lot of energy usage to power
Economical	● Economic trend (recession or inflation) affect disposable income to pay for Bedrock
Political	● AI policies may limit the full potential of Bedrock ● Bedrock Guardrails helps to block undesirable content produced by the AI that may go against company AI policies (Amazon, n.d.-b)
Legal	● Responsibility and accountability towards the content that Bedrock generates for Amazon
Ethical	● Data privacy concerns regarding data used to training the AI for Bedrock

Figure 4: STEEPLE Analysis of AI in Services and Amazon Bedrock

All in all, the new introduction of Amazon Bedrock as a tool for sellers in e-commerce has brought a better experience in this diversified market. Although Titan Embeddings was criticized early on, Amazon's improvements have allowed for a better customer experience and a higher customer satisfaction, leading to a competitive advantage in the e-commerce industry. The STEEPLE analysis shows how there are both positive and negative external influences on the change with AI in the services operations. Amazon gains a competitive advantage by utilizing opportunities and working to address the negative aspects.

3. Conclusion

Therefore, Amazon's new implementations of artificial intelligence have affected their operations in distribution, sales and services. The Sequoia system in the distribution sector has brought more same-day deliveries, yet there are criticisms of its safety issues that concern the stakeholders of the government and employees. It is analyzed through a SWOT analysis. In the sales sector, the new chatbot Rufus has made it easier for customers to navigate the website, but was introduced late, with the growth strategies seen through the Ansoff Matrix. There is the new service of Amazon Bedrock, which is analyzed with a STEEPLE analysis. Bedrock focuses on the new market of sellers in the e-commerce sector, but there was criticism of it at first.

Ultimately, the introduction of artificial intelligence into the business operations of Amazon has provided a competitive advantage in the e-commerce sector overall. The distribution sector has a higher customer satisfaction, and thus higher customer loyalty due to the same-day deliveries. That brings in more sales revenue and overpowers the negative impacts of the safety issues on the brand image. Rufus in the sales sector

allows for increased customer engagement, leading to higher customer satisfaction and a competitive advantage so that customers will stay with Amazon. The new service of Bedrock diversifies the market, providing a lower risk. It provides a competitive advantage as sellers are encouraged to choose Amazon due to the tools available to facilitate selling. The higher quantity of sellers also creates an incentive for customers to buy on Amazon due to the greater amount of products and choices.

Other than the business operations of distribution, sales and services, Amazon does have artificial intelligence in other sectors that may affect its competitiveness. Within the three business operations analyzed in this report, there are other tools than just the Sequoia system, Rufus and Bedrock that are focused on. An investigation of these other implementations of AI will allow for a more complete examination.

4. Bibliography

4.1 Supporting documents

Supporting document 1:

Bordoloi, S. K. (2024, September 24). *Rufus & Metis Tell Tales of Amazon's Delayed AI Entry*. Sify. https://www.sify.com/ai-analytics/rufus-metis-tell-tales-of-amazons-delayed-ai-entry/

Supporting document 2:

Bishop, T. (2023, October 24). *A first-hand look at Amazon's new "Sequoia" warehouse robotic system*. GeekWire. https://www.geekwire.com/2023/a-first-hand-look-at-amazons-new-sequoia-warehouse-robotic-system-in-action/

Supporting document 3:

Amazon. (2024b, October 31). *Amazon.com Announces Third Quarter Results*. Aboutamazon.com. https://ir.aboutamazon.com/news-release/news-release-details/2024/Amazon.com-Announces-Third-Quarter-Results/default.aspx

Supporting document 4:

Vuocolo, A. (2023, October 31). *Amazon says new robots will improve safety. Critics aren't so sure.* Retail Brew. https://www.retailbrew.com/stories/2023/10/31/amazon-says-new-robots-will-improve-safety-critics-aren-t-so-sure

Supporting document 5:

Lamaakal, I. (2024, January 26). *Unveiling Amazon Bedrock: The Next Revolution in E-Commerce and Cloud Computing*. Medium. https://medium.com/@ismail.lamaakal/unveiling-amazon-bedrock-the-next-revolution-in-e-commerce-and-cloud-computing-878179e7c580

4.2 Other work cited

References

Amazon. (n.d.-a). *Build Generative AI Applications with Foundation Models - Amazon Bedrock Pricing - AWS*. Amazon Web Services, Inc. https://aws.amazon.com/bedrock/pricing/

Amazon. (n.d.-b). *Guardrails – Amazon Bedrock – AWS*. Amazon Web Services, Inc. https://aws.amazon.com/bedrock/guardrails/

Amazon. (2023a, April 27). *Amazon.com Announces First Quarter Results*. Ir.aboutamazon.com.

https://ir.aboutamazon.com/news-release/news-release-details/2023/Amazon.com-Announces-First-Quarter-Results/

Amazon. (2023b, August 3). *Amazon.com Announces Second Quarter Results*. Ir.aboutamazon.com. https://ir.aboutamazon.com/news-release/news-release-details/2023/Amazon.com-Announces-Second-Quarter-Results/

Amazon. (2024, April 30). *Amazon.com Announces First Quarter Results*. Aboutamazon.com. https://ir.aboutamazon.com/news-release/news-release-details/2024/Amazon.com-Announces-First-Quarter-Results-68b9258cd/

Donelan, P. (2024, April 9). *Can Enterprise-Level Businesses Leverage Amazon Bedrock to Unlock Ecommerce Success?* Canopy Management. https://canopymanagement.com/leverage-amazon-bedrock-to-unlock-ecommerce-success/

Dresser, S. (2023, October 18). *Amazon announces 2 new ways it's using robots to assist employees and deliver for customers*. Amazon; www.aboutamazon.com. https://www.aboutamazon.com/news/operations/amazon-introduces-new-robotics-solutions

Howland, D. (2024, February 2). *Move over, Alexa: Amazon launches AI shopping tool "Rufus."* Retail Dive. https://www.retaildive.com/news/alexa-amazon-ai-shopping-tool-rufus/706382/

Huang, G. (2024, July 25). *Amazon search is undergoing a huge shift right now and it will affect all sellers selling on Amazon. I did a deep dive of the white paper on COSMO and Rufus recently as well as speaking to several AI experts.*

Linkedin.com.
https://www.linkedin.com/pulse/what-amazon-sellers-need-know-amazons-rufus-ai-cosmo-search-huang-jlruc

Koetsier, J. (2022, April 14). *Keeping Up With Amazon: How Warehouse Robots Are Revolutionizing The On-Demand Economy*. Forbes. https://www.forbes.com/sites/johnkoetsier/2022/04/04/keeping-up-with-amazon-how-warehouse-robotics-is-revolutionizing-the-on-demand-economy/

Marie Gobiet. (2024, February 15). *The History of Chatbots - From ELIZA to Alexa*. Chatbots and Voice Assistants from Onlim. https://onlim.com/en/the-history-of-chatbots/

Rebelution e-Commerce. (2024, April 8). *The Evolution of Amazon's AI: A Timeline of Partnering for a Seamless Customer Experience*. Linkedin. https://www.linkedin.com/pulse/evolution-amazons-ai-timeline-partnering-seamless-pxfhc

Rosala, M. (2021, April 18). *Stakeholder Analysis for UX Projects*. Nielsen Norman Group. https://www.nngroup.com/articles/stakeholder-analysis/

Schmid, P. (2023, November 3). *Amazon Bedrock: How good (bad) is Titan Embeddings?* Philschmid.de; Philipp Schmid. https://www.philschmid.de/amazon-titan-embeddings

Stehle, J., Eusebius, N., Khanuja, M., Roy, M., & Pathak, R. (2024, January 31). *Getting started with Amazon Titan Text Embeddings in Amazon Bedrock | Amazon Web Services*. Amazon Web Services. https://aws.amazon.com/blogs/machine-learning/getting-started-with-amazon-titan-text-embeddings/