

Summer 2019

Enabling shift in retail using data: Case of Amazon

Nikita Grover

Follow this and additional works at: <https://lib.dr.iastate.edu/creativecomponents>



Part of the [Business Analytics Commons](#), [Business Intelligence Commons](#), and the [E-Commerce Commons](#)

Recommended Citation

Grover, Nikita, "Enabling shift in retail using data: Case of Amazon" (2019). *Creative Components*. 310.
<https://lib.dr.iastate.edu/creativecomponents/310>

This Creative Component is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Creative Components by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Enabling shift in retail using data: Case of Amazon

by

Nikita Grover

A creative component submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Information Systems

Program of Study Committee:
Dr. Anthony M. Townsend, Major Professor

The student author, whose presentation was approved by the program of the study committee, is solely responsible for the content of the report. The Graduate College will ensure this report is globally accessible and will not permit alteration after a degree is conferred.

Iowa State University

Ames, Iowa

2019

TABLE OF CONTENTS

	Page
LIST OF FIGURES	v
NOMENCLATURE	vii
ACKNOWLEDGMENTS	viii
ABSTRACT	vi
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE REVIEW	3
CHAPTER 3 THE RETAIL GIANT	6
CHAPTER 4 BUSINESS MODEL AND VALUE PROPOSITIONS	8
4.1 Business Model	8
4.2 Virtuous Cycle	9
4.3 Value Propositions	9
CHAPTER 5 ENHANCEMENTS IN RETAIL	13
CHAPTER 6 CUSTOMER RELATIONSHIP MANAGEMENT	15
CHAPTER 7 PERSONALIZATION AND RECOMMENDATION	18
7.1 Exploratory Data Analysis	18
7.2 Recommendation Algorithms	21
7.3 An example of a recommendation engine	25
CHAPTER 8 OUTCOME OF THE RETAIL SHIFT	28
8.1 Toys R Us	28
8.2 Risk factors for Amazon	30
CHAPTER 9 CONCLUSION AND FUTURE SCOPE	31
REFERENCES	32
APPENDIX	34

LIST OF FIGURES

	Page
Figure 1 Organizing framework	1
Figure 2 Timeline of Amazon	7
Figure 3 Business model canvas	8
Figure 4 Virtuous cycle of Amazon	9
Figure 5 Product categories.....	12
Figure 6 Enhancements in retail.....	13
Figure 7 CRM factors for success	16
Figure 8 Top 10 manufacturers	19
Figure 9 Top 10 manufacturers by reviews and rating.....	19
Figure 10 Bottom 10 manufacturers.....	20
Figure 11 Category distribution	20
Figure 12 Price distribution.....	21
Figure 13 Recommendation engine techniques.....	22
Figure 14 Data usage cycle	23
Figure 15.1 Recommendation algorithm: General recommendations	24
Figure 15.2 Recommendation algorithm: Similar items table	24
Figure 16 Approach 1 results	25
Figure 17 Approach 2 result.....	26
Figure 18 Approach 3 result.....	26
Figure 19 Approach 4 result -most popular category.....	27
Figure 20 Approach 4 result- toy categories	27

NOMENCLATURE

AWS	Amazon Web Services
CRM	Customer Relationship Management
AI	Artificial Intelligence
SMBs	Small and Medium-Sized Businesses
LEGO	Leg Godt
EDA	Exploratory Data Analysis

ACKNOWLEDGMENTS

I would first like to thank my major professor, Dr. Anthony M. Townsend for his extensive academic guidance, patience, and support during my project. The assignments given by him in the MIS 557X course guided me in the right direction towards my creative component. I would also like to thank the professors of the College of Business whose courses provided me the insight and inspiration behind this project.

I would like to take this opportunity to express my profound gratitude to my parents who supported me in the decision to pursue a master's in Information Systems at Iowa State University.

Finally, I would like to thank my friends, colleagues, the department faculty, and staff for making my time at Iowa State University a wonderful experience.

ABSTRACT

In this competitive retail world, retailers that can associate with their users by providing directed information, and offering customer-focused products and services, have the potential to be successful. Both brick-and-mortar and online retailers face competition from Amazon and to survive in today's competitive retail world, companies should adapt to changes in consumer behavior and develop strategies keeping their customers in mind. If used in the right direction, customers' data can provide a personalized experience which builds trust and loyalty in the firm. The purpose of this creative component project is to increase knowledge and understanding of the leader in retail, Amazon, to study the ways it implements customer relationship management and its business model. In this report, a case study of Amazon is performed where Amazon's journey from an online book store to a retail giant, its value proposition, and CRM strategy, and recommendation algorithm is described. Real data of toy products sold on Amazon is used to perform exploratory data analysis and to build a recommendation engine using multiple approaches. The report also presents an example of one of the victims of the retail shift, "Toys R Us" that went bankrupt. The study of Toys R Us would highlight the firm's journey and some of the reasons that led to the demise of the firm because of the shift in retail. The last chapter features the conclusion which highlights the summary and takeaways from the creative component project.

CHAPTER-1

INTRODUCTION

Amazon has been ranked as the most trusted shopping site in the US. When it began in the 1990s, it started as an online bookseller but now it is the store that sells anything imaginable. A strong emphasis on customers is the foundation of any company's success. Jeff Bezos once said, "Obsess about customers, not competitors". Jeff Bezos has time and again stressed on the importance of focusing on customers, and how customers are the foundation behind any strategy of Amazon. Customer experience is the impression that you create on the customer at any touchpoint so that the customer trusts the firm and is loyal to build a long-term relationship with that firm.

Amazon's retail service focuses on "more types of products and at lower prices". In Chapter-3, the value proposition of Amazon is featured which describes the three main things that Amazon focuses on when it comes to their customers. The vast shift in customer expectations, increased competition, and technology have led to the changes in customer focus strategy by the companies. When it comes to retail, Amazon has changed the way retail functions for a few years. These developments in the retail business of Amazon is focused on their customers and keeping that in mind, I have highlighted four of the retail enhancements of Amazon. Figure 1 illustrates that the future of retail is changing with the use of the below-mentioned areas. This report highlights the use of almost all of the areas used by Amazon to shape the future of retail.



Figure 1: An Organizing framework figure taken from a research paper: Grewal, Dhruv, Anne L. Roggeveen, and Jens Nordfält. "The Future of Retailing." *Journal of Retailing, The Future of Retailing*, 93, no. 1 (March 1, 2017): 1-6. <https://doi.org/10.1016/j.jretai.2016.12.008>.

Customer interaction with companies requires better tools and services and Amazon provides these services using the latest technology. Using enormous customers' data, Amazon has built its own algorithm that provides personalized recommendations to its users. The algorithm instead of clustering customers, clusters products. It is a powerful tool that gives businesses the ability to predict what customers would like or not like. Using data of toy products, I have performed data analysis and using insights, I have built a recommendation engine as featured in Chapter- 7.

Retailers these days struggle with massive debt, inefficient operations, lack of customer data, inability to adopt the latest technology, innovate and focus on customers. Even though Amazon has gained a sustainable competitive advantage, it still has some threats and risks from its competitors and retail market. Risk factors that could potentially affect Amazon are highlighted in Chapter-9. The results of the shift in retail have caused dozens of retailers to go bankrupt and many to close. The journey of Toys R Us which filed for bankruptcy after a crippling year and few of the reasons that led to its demise. The last chapter concludes the summary and key points of the creative component project. There is also future research mentioned which illustrates how this project can be used as the foundation to perform case studies on Amazon, recommendation engine and the retail shift.

LEARNING OBJECTIVE

As a graduate student in Information Systems, I wanted to learn more about the retail giant 'Amazon', its business model, value propositions, and implementation of CRM. We have been taught about the business models using case studies of some of the famous firms in our curriculum that I thought was really interesting, as it gives real-world insights. Therefore, I wanted to do a real-world project and gain insights on the shift in retail. One of the best customer-focus services of Amazon is the recommendation engine. I wanted to understand the different types of recommendation algorithms and the in-house recommendation engine of Amazon. Therefore, using the data of toy products of Amazon, I've performed data analysis and using the insights from the analysis a trivial recommendation engine is developed. In addition, to highlight the victims of the retail shift, I have focused on Toys R Us and have learned about its journey and the reasons for its demise.

CHAPTER-2

LITERATURE REVIEW

The world of online shopping is driven by massive competition. Amazon like other giants such as Apple, Google and Facebook leading in their market area has the power for structural change to the technology industry. From the time Amazon started until today, it never stopped innovating or experimenting but the only thing that remained constant is customer focus. Jeff Bezos has continuously stressed the importance of prioritizing customers. Bezos once said, *“If you’re competitor-focused, you have to wait until there is a competitor doing something. Being customer-focused allows you to be more pioneering.”*

A lot of Amazon's developments, innovations, services, and strategies are customer focused which gives an edge to Amazon because it has the platform to provide the best-personalized experience a customer has seen. Service, Software Advisory. “Case Study: How CRM Is The Secret Behind Amazon’s Success.” <https://www.softwareadvisoryservice.com/en/case-studies/case-study-how-CRM-is-the-secret-behind-amazons-success/> mentions that CRM is no longer considered as a trend but rather a standard requirement for business. Amazon implements CRM extensively and using multiple research papers and articles as cited in this report, chapter-4 and 5 feature business model of Amazon and the customer-focus strategy implemented by Amazon.

Grewal, Dhruv, Anne L. Roggeveen, and Jens Nordfält. “The Future of Retailing.” *Journal of Retailing*, The Future of Retailing, 93, no. 1 (March 1, 2017): 1–6. <https://doi.org/10.1016/j.jretai.2016.12.008>. This research paper focuses on the five key areas such as 1) technology and tools 2) visual displays 3) consumption and engagement 4) big data collection and usage 5) analytics and profitability. Each section is explained in ways how these areas are shaping the future of retail. Two of the above mentioned five keys i.e. data and analytics are used in this report to describe how critical it is to value customers feedback and analyzing customers data to provide a personalized experience.

Bozkurt, Çağlar. “Amazon’s Retail Expansion Strategy” <https://www.twentify.com/blog/amazons-retail-expansion-strategy> features the steps Amazon took to stay ahead in retail such as the acquisition of Whole Foods and the start of Amazon Go. The firm has left no stone unturned to change the face of retail. Who would have imagined 20 years ago that with the expansion in technology, we would be provided with a lot of services to make our lives easier? Artificial intelligence plays a huge role in process improvements and improving how business is done.

Danziger, Pamela N. “Thinking Of Selling On Amazon Marketplace? Here Are The Pros And Cons.” Forbes. Accessed May 30, 2019. <https://www.forbes.com/sites/pamdanziger/2018/04/27/pros-and-cons-of-amazon-marketplace-for-small-and-mid-sized-businesses/>. This article mentions another advancement in retail by Amazon which is the Amazon Marketplace that has sold half of the goods sold on Amazon in total. As one of the advantages of Amazon, it helps SMBs to grow. It is important that retailers build their own website, but they cannot compete with Amazon's services and platform. This platform is easy to use and attracts a large customer base of Amazon especially for the firms that have exclusive products.

An article by Forbes reveals that 88% of consumers trust online reviews and ratings along with product recommendations. Taking advantage of customers' feedback is crucial for retailers to expand and improve their strategies. If bad reviews are more than good for a particular product, customers can get influenced and that could potentially affect the sales of that product. "Amazon's Recommendation Engine: The Secret To Selling More Online.” <http://rejoiner.com/resources/amazon-recommendations-secret-selling-online/>. “Amazon’s Giving Away the AI Behind Its Product Recommendations | WIRED.” <https://www.wired.com/2016/05/amazons-giving-away-ai-behind-product-recommendations/>

This article mentions that Amazon has adopted AI to know its customers inside out. Product recommendations are one of the major ways of describing how Amazon has adopted AI.

This creative component features an implementation of CRM which is Recommendation engine using real-world data of Amazon. The big data of toy products sold on Amazon is taken from the Kaggle platform. "Toy Products on Amazon." Accessed October 27, 2018. <https://www.kaggle.com/PromptCloudHQ/toy-products-on-amazon>. Kaggle is a data science platform where real-world challenges of firms can be found. Previous works on this dataset don't include a recommendation engine therefore, my analysis will help the beginners who want to use this dataset for future analysis.

Finally, to gain a competitive advantage is one thing but to remain sustainable takes continuous efforts. "Here's A List Of 68 Bankruptcies In The Retail Apocalypse And Why They Failed." CB Insights Research, March 12, 2019. <https://www.cbinsights.com/research/retail-apocalypse-timeline-infographic/>. This article mentions retailers who suffered the retail apocalypse since 2015. Some of the firms are big names including Diesel, JC Penny, Payless, Sears, Nine West, and Toys R Us. Toys R Us is one of the firm's that I have included in this report to illustrate the victims of the retail shift. The below article mentions that the firm was guilty of mismanagement. Radio, Business, Podcasts, and North America. "The Demise of Toys R Us: What Went Wrong." <https://knowledge.wharton.upenn.edu/article/the-demise-of-toys-r-us/>. The article highlights a few of the reasons that caused the firm to fail and it also highlights that the sales of toys have declined in general as there is not much growth in this area. Chapter – 9 shows the journey of Toys R Us and the reasons that according to me were responsible for the failure of the firm. There are some suggestions mentioned that the company could have adopted or tried to still be around. Similar to the risk that was faced by Toys R Us, there are risks for each and every retailer despite being the leader in the industry. Having said that, Amazon faces risks too which are described in this report. Finally, the last chapter concludes the summary and key takeaways from the report.

CHAPTER-3

THE RETAIL GIANT

The firm that started as a bookselling company is now an online retailer giant. Amazon is now a titan of e-commerce and is guided by customer obsession rather than competitor focus. The mission and vision of Amazon.com are:

Our vision is to be the earth's most customer-centric company: to build a place where people can come to find and discover anything they might want to buy online, and endeavors to offer its customers the lowest possible prices.

As displayed by its mission, every strategy that Amazon makes revolves around its customers. It is using emerging technology to engage its customers, provide a personalized experience, and make lives of its users easier. Amazon is the leader in collecting, storing, processing, and analyzing customers' information as a means of determining what customers want, and how they are spending their money. Amazon secures inventory in two ways 1) The company buys products from wholesale vendors and resells them 2) It lets independent merchants sell their own products on the marketplace. Since 2017, Amazon has changed the face of retail by taking some extraordinary steps in innovation, technology, and customer-focus. It has acquired Whole Foods and has launched a new kind of retail experience called Amazon Go. These enhancements have provided Amazon the edge and inspiration to other retailers to compete in this market. Today its business is more than just retail. It is a firm that offers many creative business lines. All of its different subsidiaries are helping Amazon grow and succeed.

Amazon owns the richest data about consumers, retailers, and manufacturers. This allows the giant to use technology for better decision-making and optimize the shopping experience for its customers. The firm combines a customer-centric approach along with data-driven decision making to design and capture the value and therefore it is crucial to learn from the journey of Amazon. Figure 2 depicts the timeline of Amazon:

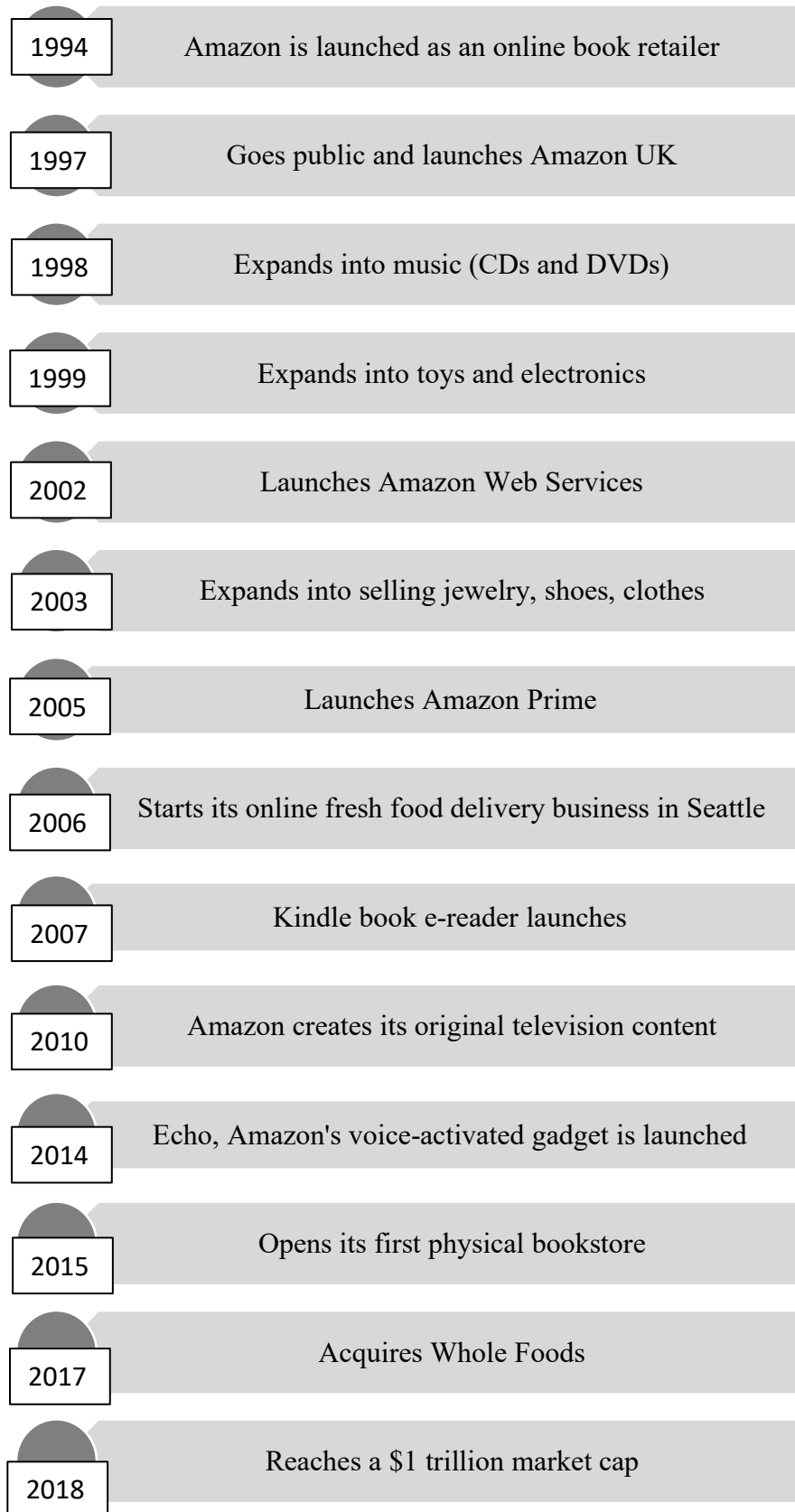


Figure 2: Timeline of Amazon

CHAPTER-4

BUSINESS MODEL & VALUE PROPOSITION

4.1 BUSINESS MODEL: Amazon sells goods directly to its consumers. In addition to direct sales, Amazon offers a platform for other retailers to sell their products. While Amazon doesn't charge a fee for its retailer partners to list items, the company does retain a portion of the sales as commission. It makes almost 70% of its revenue from the product sales and that was the foundation to grow other more profitable segments. Below is the business model canvas that shows the value propositions, customer relationships, channels, customer segments, and revenue streams.

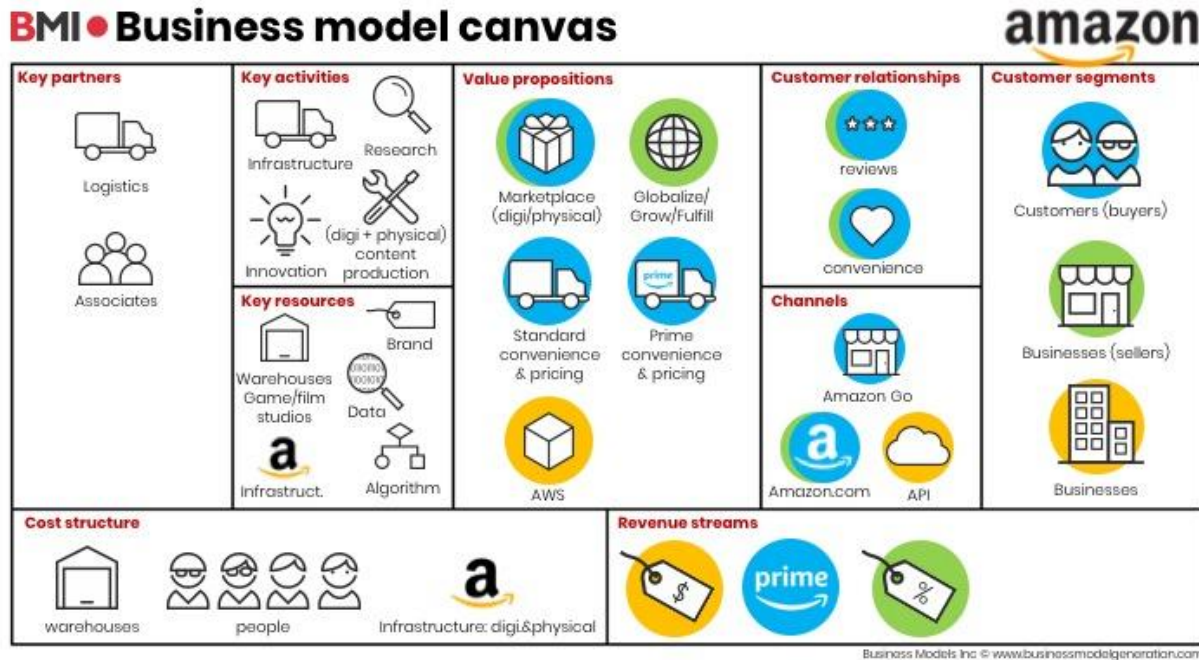


Figure 3: Business model canvas. This figure is taken from: “Learn What the Exponential Elements Are in the Business Model of Amazon.” Business Models Inc. Accessed May 29, 2019. <https://www.businessmodelsinc.com/exponential-business-model/amazon/>

4.2 VIRTUOUS CYCLE OF AMAZON: The below figure is the virtuous cycle of Amazon that shows the flow of cash and has been the marketing strategy of Amazon since years.

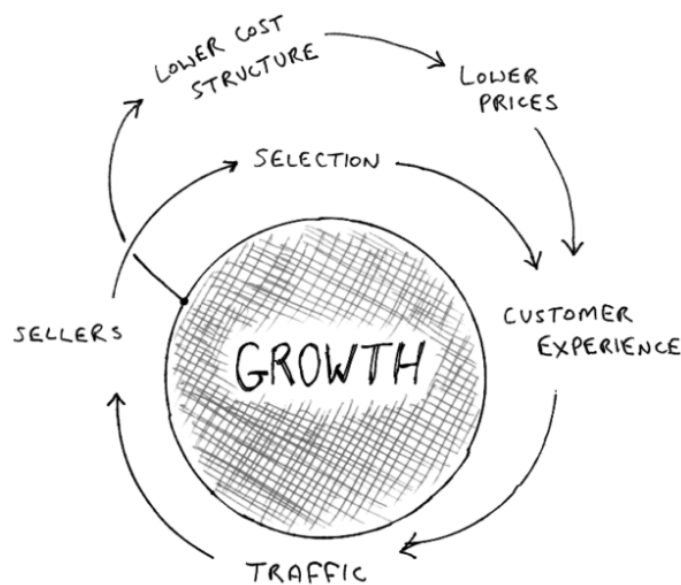


Figure 4: Virtuous cycle of Amazon. This figure is taken from: "Amazon Business Model." Accessed May 29, 2019. <https://www.innovationtactics.com/amazon-business-model-part-2/>.

It is a strategy that starts from customer experience to drive traffic to the platform and inviting third-party sellers to join the platform which improves the vast selection of products. Selection and lower prices are Amazon's key objectives from the very first day. Amazon made a wise decision of passing higher profits to customers via sustained low product prices and reinvesting the rest of their surpluses into growth. A fair portion of these growth investments goes into their fulfillment and delivery network that in turn, helps to further lower their unit costs, and amplifies the subsequent elements of the virtuous cycle and the cycle continues.

4.3 VALUE PROPOSITIONS

When it comes to the customer-focus strategy, there are primarily three customer value propositions that Amazon focuses on:

1. **Low prices**
2. **Fast delivery speed**
3. **Vast selection**

- **Low Prices**

Bezos, *“There are two kinds of retailers; Folks who work to figure out how to charge more and there are companies that work to figure out how to charge less, and we are going to be the second, full-stop.”*

Amazon offers such low prices that they have displaced Walmart as being the leader in the price category. The low prices are provided without compromising on the quality and it does so by leveraging technology. In early 2001, Bezos agreed to increase the prices of a few products because Amazon was struggling with getting higher profits. Bezos then got aware of Costco's strategy and success and decided that whatever may the situation be, Amazon should have everyday low prices. By doing so, Bezos believed that Amazon could establish a massive competitive edge.

Pricing strategies

Amazon changes prices of millions of products every day using various pricing strategies.

1. Price dynamism- Prices of products are changed 15-20% of the products per day
2. Price perception- Amazon's low prices on the top viewed and best-selling items drive a perception that the firm has products of low prices overall.
3. Demand/Supply pricing- Demand and supply largely influence the pricing of any seller. It is also believed that Amazon holds surplus profits on a Marketplace product to itself rather than passing it to the merchant.
4. Competition monitoring-Each retailer on Amazon monitors its competitor pricing and changes the pricing strategy every day.
5. Seasoned pricing- Seasoned prices such as Black Friday and Christmas have lower prices and thereby leads to an increase in sales.
6. Bundling/Recommendations- Bundling with discounts using recommendation engine helps Amazon to sell 2-3 products together instead of just one. It suggests similar products using “Customers who bought this item also bought”
7. Deals/Promotions- Most of the days, Amazon has today’s deals on the home page that gives discounted prices and people end up viewing such items and buying items, even if they don’t need such items because they are on promotions.

- **Fast delivery speed**

Amazon has achieved great heights through the speed of delivery. They have shaped customer expectations to quicker delivery times. To deliver products faster, Amazon Prime was launched in 2005 when in the beginning members paid a higher amount for free 2-day shipping on eligible purchases. Since then, the list of benefits that Prime provides has increased a lot. Currently, 6 million people have Amazon Prime memberships in the US. From its enormous number of nationwide warehouses to its large network of logistics partners and delivery drivers, Amazon goes to great lengths to provide customers the fastest and reliable shopping experience. An average seller simply cannot match the shipping and delivery capabilities of Amazon.

Amazon's fulfillment center is the key enabler of fast delivery and a vast selection of items. Amazon has been expanding from fulfillment centers to sortation and delivery centers to Amazon prime airplanes and air hubs.

- 1) Inbound cross-dock center- These centers receive goods from different vendors. They are closer to ports and borders and act as buffers to package the incoming goods into truckloads and replenish fulfillment centers as needed.
- 2) Fulfillment centers- Fulfillment centers are the heart of storage and distribution of goods. Newer fulfillment centers are located closer to population-dense areas to reduce outbound transportation costs.
- 3) Regional Sortation centers- These centers perform the purpose of gaining greater control over delivery costs, delivery speed, and customer experience. These centers are nearer to the final destination of packages than to the fulfillment centers.
- 4) Delivery Stations- They are generally positioned in metropolitan areas and are smaller in size than sortation centers. These stations started in 2013. Packages arrive from either sortation centers or fulfillment centers, they are sorted by zip code, dispatched directly via local couriers or Amazon delivery service partners.

- **VAST SELECTION**

Amazon has expanded from books and media to jewelry, clothes, and services. In 1995, it used to sell only its own products and it began letting other vendors onto its product listings in 2000. Now, Amazon has opened a whole new world of comfort and trust for its customers where customers can buy products at the best prices, with a vast selection from multiple manufacturers and sellers. The firm offers the same level of experience as one gets from visiting Walmart or Target. There are millions of products which are competitive in price so a customer can choose from this vast selection of products.

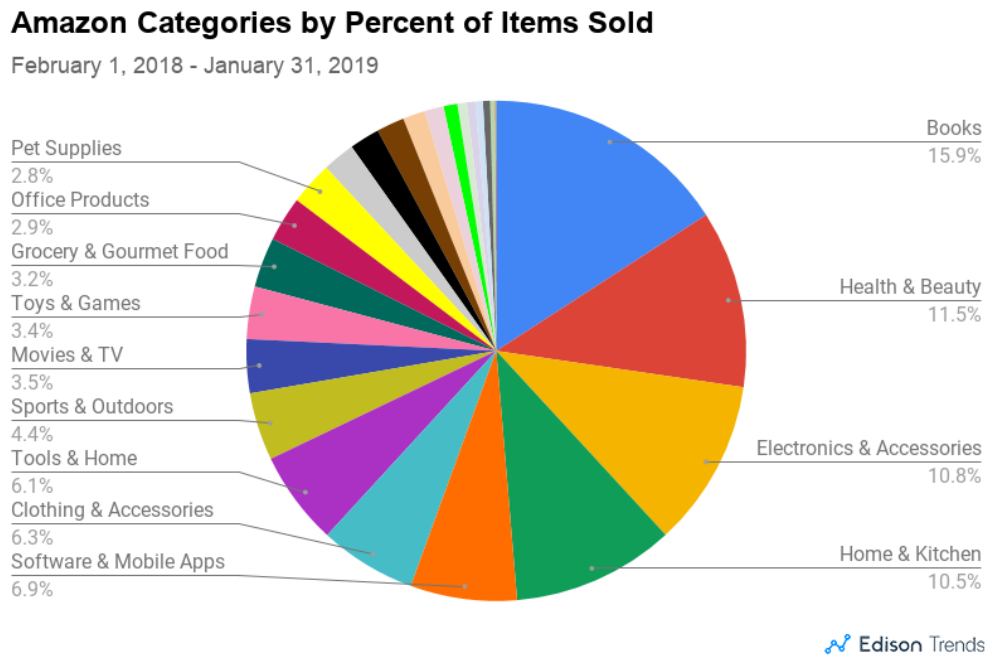


Figure 5: Product categories sold on Amazon. This figure is taken from; "These Were 2018's Top Selling Product Categories at Amazon and eBay." Accessed May 29, 2019. <https://trends.edison.tech/research/2018-ebay-vs-amazon.html>.

CHAPTER- 5

ENHANCEMENTS IN RETAIL

In the past few years, there has been a shift in Amazon's strategy of retail. It is now moving into brick-and-mortar stores. Amazon is not just following any brick-and-mortar store to provide a physical store experience but is shifting physical store experience using advanced technology. Amazon realized that if Amazon remained only an e-commerce retailer, it will miss out on the ways to provide customers great shopping experience. The firm wants to be everywhere and wants to provide both an online experience along with an in-store shopping experience. The focus or strategy is letting customers decide what they want to do and making strategies around its customers. Amazon is giving its customers a choice to shop wherever they prefer. As much as online shopping has its pros, there are chances that some people still prefer in-store shopping experience especially during vacations or the ones who aren't working 9 to 5 jobs. Below are the enhancements in retail that Amazon has started:



Figure 6: Enhancements in retail: Bozkurt, Çağlar. "Amazon's Retail Expansion Strategy." Accessed May 25, 2019. <https://www.twentify.com/blog/amazons-retail-expansion-strategy>.

- **Amazon Prime-** Prime is the critical element of Amazon growth strategy. About 63% of Amazon customers are prime members. Jeff Bezos mentioned that Amazon Prime was started because customers love free shipping. Amazon's prime customers spend approximately \$1300 on average a year, twice as much as non-prime customers. Amazon prime offers a

broad choice of shipping methods and speeds. It not only provides quicker delivery but also comes with additional perks such as music, movies and more. Today, Prime has exceeded 100 million members and will continue to be the best revenue source for Amazon.

- **Marketplace-** This site enables independent sellers to buy or sell new or used products on Amazon. It has been said that third-party sales on this platform account for almost half of Amazon's unit sales. Marketplace sellers are crucial to Amazon's overall growth. It is very easy to start selling on the Amazon marketplace. Although it's a great platform for the sellers, companies should have pricing control in order to maintain adequate margins to give to Amazon as commission.
- **Whole Foods-** Amazon acquired Whole Foods in 2017 and got access to 460 stores in U.S., Canada, and Britain overnight. Whole Foods has significant customer data in the in-store shopping which allows Amazon to use the data to make more strategic decisions and improve on grocery shopping. By acquiring Whole Foods, Amazon also got access to an extensive list of private brand label products and an increased reach and service quality for its customers.
- **Amazon Go-** It is a chain of convenience stores currently in four locations i.e. Seattle, Chicago, San Francisco, and New York. Customers should have the Amazon Go app which allows consumers to add others in their Amazon account. According to Bloomberg News, it has plans on opening 3000 stores by 2021.
- **Amazon Fresh-** It is a grocery delivery service and has partnered with the local stores to delivery of local items. There is an Amazon Fresh Pickup, a drive-in-type grocery store for Amazon Prime subscribers. There are already similar kinds of services available and are used globally but with Amazon as a brand, people will definitely prefer Amazon Go over others.

CHAPTER-6

CUSTOMER RELATIONSHIP MANAGEMENT

Customer Relationship Management is the key to manage and synchronize business communication and information. It has been around since the 1990s and has gone through massive development using analytics and management. In today's world, CRM is no longer a trend but a requirement to succeed and has become a standard for business these days. It is defined as identifying the best customer and expanding the value from them by satisfying and retaining them. CRM along with other services that an e-commerce retailer offers could make or break any competitive firm.

Amazon implements CRM extensively and takes each and every customer into account. Amazon has its own CRM software in-house. The software is tailored to its own requirements and needs. It allows Amazon to encapsulate customer data which leads to improving the overall on-site experience of the customer.

"We see our customers as invited guests to a party, and we are the hosts. It's our job every day to make every important aspect of the customer experience a little bit better." -Jeff Bezos

Amazon uses CRM in various ways and that has helped the firm to grow successful since years. When customers buy something on Amazon for the first time, they set up an account which makes the process smoother and personalized for them. CRM brings tailored offers and promotions based on transaction history. The data stored regarding personal and payment information makes it convenient for the customers to use the one-click service. Amazon's implementation of CRM has been influential in the growth of its services.

Last year, I ordered a twin mattress from Amazon I read the reviews from other customers and checked the ratings too, but I didn't like the mattress because it wasn't what I was expecting. I placed an order to return the mattress and ordered a new one instead. As it was difficult to pack the mattress and return it, I contacted customer care asking them how I should proceed with the return. The person simply instructed me to keep the mattress. I was extremely pleased with the kind of service, level of customer satisfaction and how the firm does business. That incident made me a customer for life.

Below figure shows the three important factors for the company's success.

- User-friendly- Amazon's website is easy to understand, search products, and use. It's so convenient that anyone can use it which makes it accessible for all.
- Great selection- Company offers a huge selection of products. What started with just books, moved slowly to music, clothes, shoes, jewelry to a whole new world of cloud computing.
- Convenience- Amazon constantly gathers information about its customers which helps it to treat each customer personally and therefore offer services that retain customers.

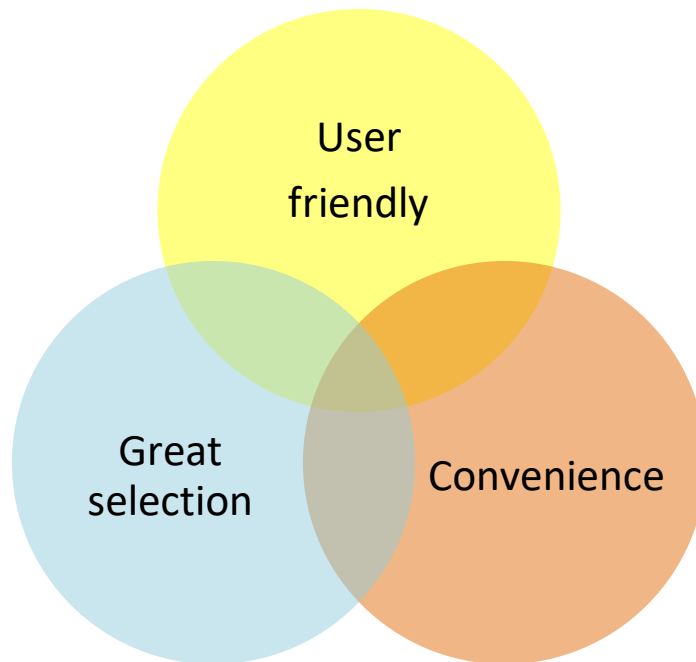


Figure 7: CRM factors for success

The following are the ways Amazon implements CRM:

- Customer Selection- Amazon uses abundant methods to select customers by knowing their customer behavior. It targets people to persuade them to use amazon.com
- Customer Acquisition- Every customer has an account on Amazon where customer information is stored such as an address, Date of Birth, card details, transaction history, etc. Amazon uses the customer account to know the customer and to satisfy them. Amazon makes the association in between the customer, communicating and viewing their interest help to Amazon gain customer trust.

- Customer Retention- It is known that 40% of Amazon's customers are frequent users which shows that customers come back to the website to buy products. This clearly displays that Amazon retains its customers.
- Customer Extension- The company integrates communication between its customers by review of products and ratings. This communication builds a level of trust between customers. Customers listen to other customers' advice and opinions on buying products.
- Customer Interaction- Interaction of customers with Amazon is so smooth that rarely a customer needs help from customer care. Customers can use the CRM software for any purpose they want. They can use the services offered by CRM software to easily access anything on the website such as canceling an order, tracking an order, track old transactions which makes it stress-free for its customers.
- Customer Care- Customer care services such as helping customers in times of need is an important part of any retailer. Customers trust Amazon because of excellent customer service.

CHAPTER-7

PERSONALIZATION AND RECOMMENDATIONS

Data on toy products sold on Amazon is taken from Kaggle. This data is preprocessed and analyzed using Python Jupyter notebook. In Section 7.1, exploratory data analysis is performed to get insights on 1) manufacturers of toy products 2) categories of products 3) price breakdown of toys. This analysis would provide a clear understanding of the niche market of toys and these three categories are further used in the development of recommendation engine. It is crucial to perform EDA as summarizes the important characteristics mainly using visualizations. In section 7.2, recommendation algorithms are studied as it is one of the best services offered by e-commerce firms that focus on improving customer experience and increase product sales. At Amazon.com, recommendation engines are used to personalize online experience for users. A trivial recommendation engine is built using data of toy products which considers customers' feedback into account.

7.1 EXPLORATORY DATA ANALYSIS

- **MANUFACTURERS:** It is important for e-commerce firms to analyze its top and bottom manufacturers, to get an insight on 1) the sales of products 2) customers feedback on the manufacturers. In order to get the best out of Amazon's value proposition, Amazon needs to analyze the prices, sales, and how well the customers are liking the products. Top manufacturers could be handled carefully by Amazon and bottom manufacturers whose products are disliked by customers could be informed so that they could improve on their manufacturing and products. If a manufacturer has consistently bad reviews and ratings that creates a negative view about Amazon and thereby it cannot let all the sellers and manufacturers sell the products on the platform even when customers aren't liking the products. Once the Top manufacturers are analyzed, they can also be used in the recommendation engine to give products of the same manufacturer if the customer is fond of a particular manufacturer.
- **Top 10 Manufacturers-** Below figure shows the top 10 manufacturers of toy products for Amazon currently. LEGO has the maximum number of products on Amazon followed by Disney and Oxford Diecast. This shows that products of the top manufacturers should be

stocked, these manufacturers could be given incentives for them to keep selling on Amazon and should be handled carefully.

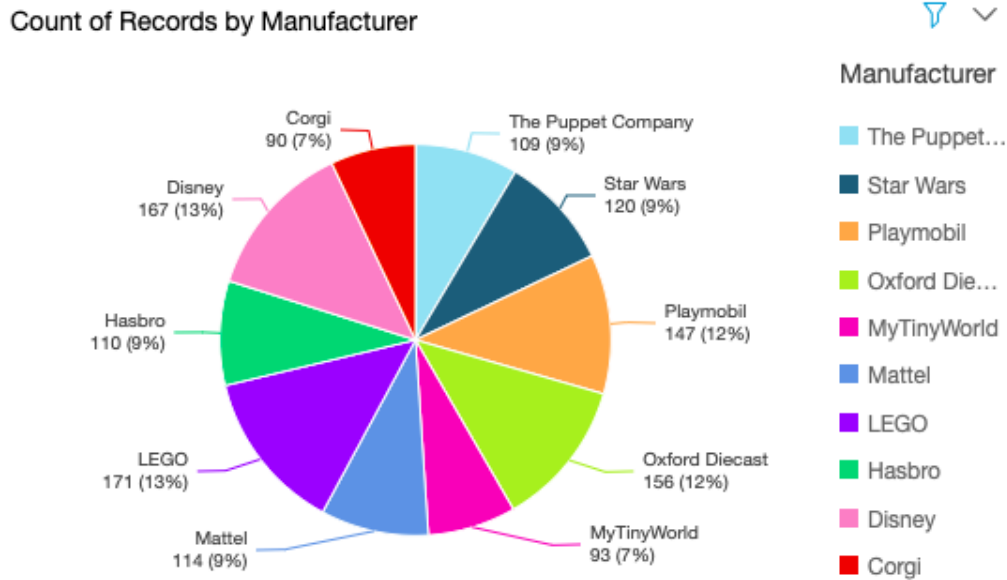


Figure 8: Top 10 Manufacturers

Top 10 Manufacturers by number of reviews & average review rating

manufacturer	number_of_reviews	average_review_rating
Playmobil	3,222	4.6861
LEGO	2,930	4.7526
Orchard Toys	1,608	4.72
Star Wars	1,595	4.7458
Nollmit	1,566	4.25
Winning Moves	1,549	4.6461
Disney	1,449	4.6892
Crayola	1,435	4.5363
Intex	1,278	4.4807
Melissa & Doug	1,189	4.7084

Figure 9: Top 10 Manufacturers by reviews and ratings

- **Bottom 10 manufacturers-** Below figure displays the bottom 10 manufacturers of toy products. All the below-shown manufacturers have just 1 product in the dataset. This

shows that customer feedback for these manufacturers should be monitored.

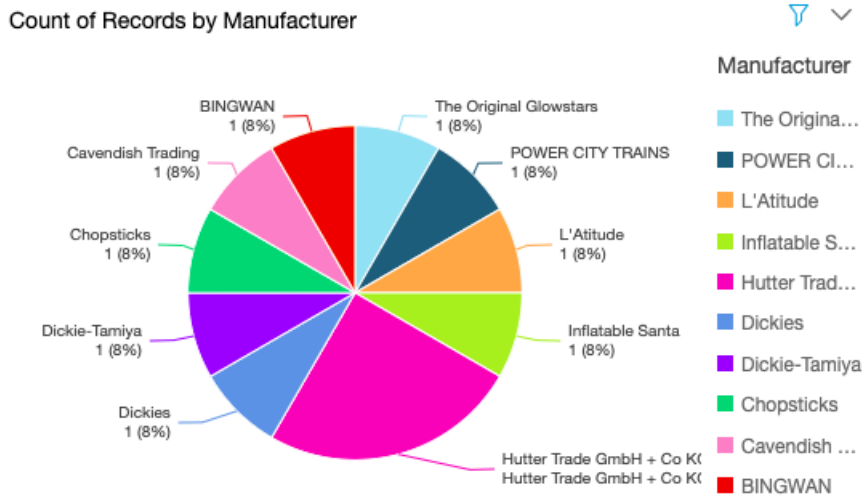


Figure 10: Bottom 10 Manufacturers

- CATEGORIES AND PRODUCTS-** It is important to understand the category of products sold to create a personalized experience for customers. The figure below provides clarity on the products per category. From the below figure, **Vehicles** is the most occurred category in terms of products and average review ratings which comes under Die-Cast & Toy Vehicles > Toy Vehicles & Accessories > Scaled Models followed by **Trains** that comes under Hobbies > Model Trains & Railway Sets > Rail Vehicles. Amazon should concentrate to have products always stocked for the below shown top 5 categories because they are liked by the customers.

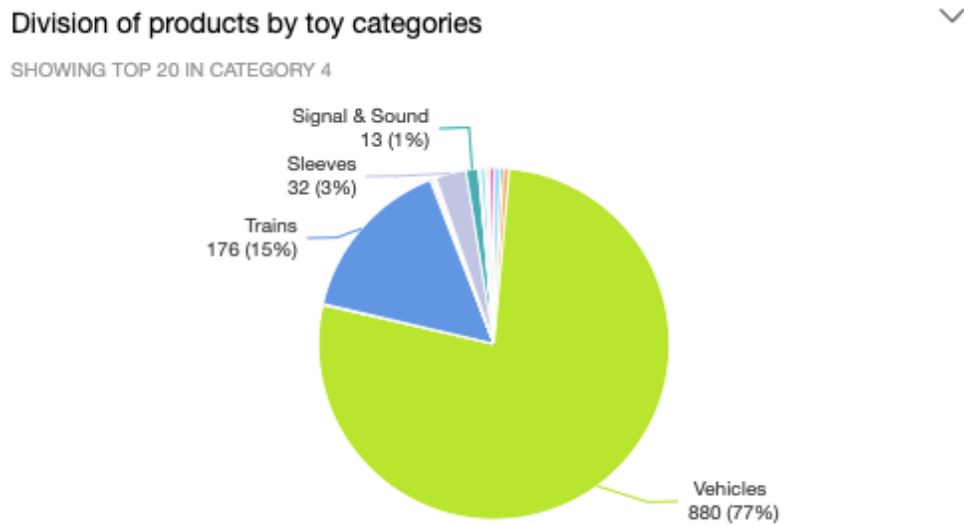


Figure 11: Category distribution

- **PRICES-** The below figure displays the top 10 prices that occur the most in the dataset. This would provide an estimate of how much Amazon could earn from the sale margin of toy products. From the manufacturer’s perspective, if they have information about this data, each manufacturer could decide how to set the prices of their toy products.

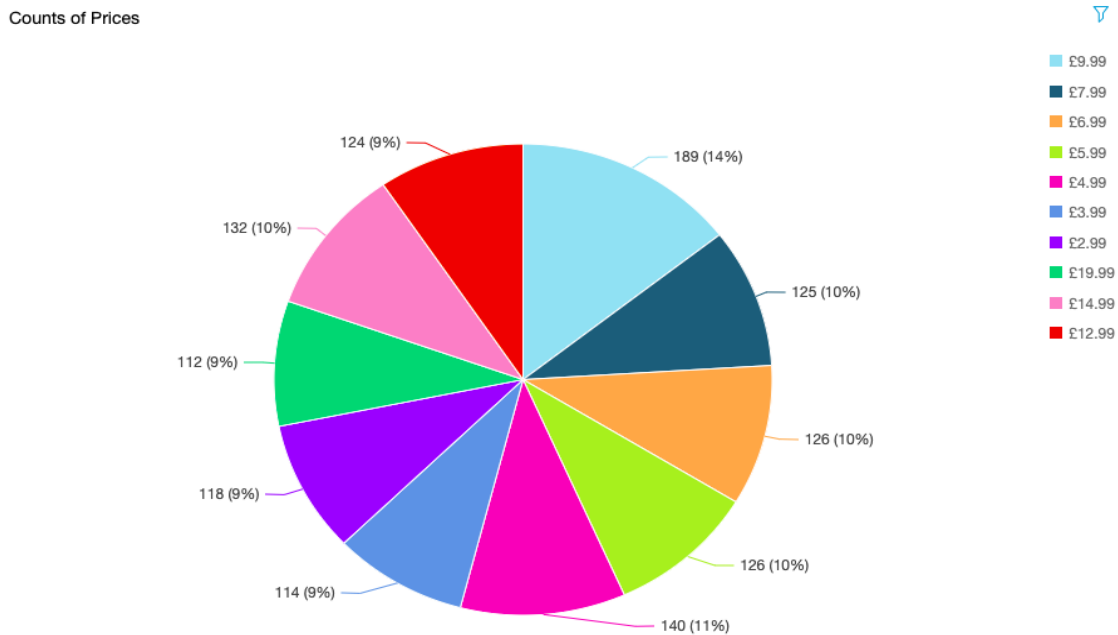


Figure 12: Price distribution

7.2 RECOMMENDATION ALGORITHMS

Personalizing customer experience is all about having customer data. In Steve Job's words – "a lot of times, people don't know what they want until you show it to them". Amazon's revenue growth relies heavily on the recommendation engine. Recommending items that are not so popular is very crucial because it will give good returns on the slow-moving inventory. The recommendation engine is considered as the best applications of AI in Amazon. 35% of all the sales are estimated to be generated by the recommendation engine

There are two main techniques of recommendation engine:

- **Collaborative filtering:** It looks at the user-product interaction by finding customers with similar transaction history and recommend the top products purchased by the

shopper. This type of approach uses transaction data, so the performance of the model is improved over time as more and more transactions are available.

- **Content-based filtering:** It looks at the product and not the customer. The content-based approach leverages product information for its recommendations. We don't need lots of transactions but just the information on the products. Here, similar products are recommended based on the type of the product or for a book, it may consider the category or the author to recommend similar books.

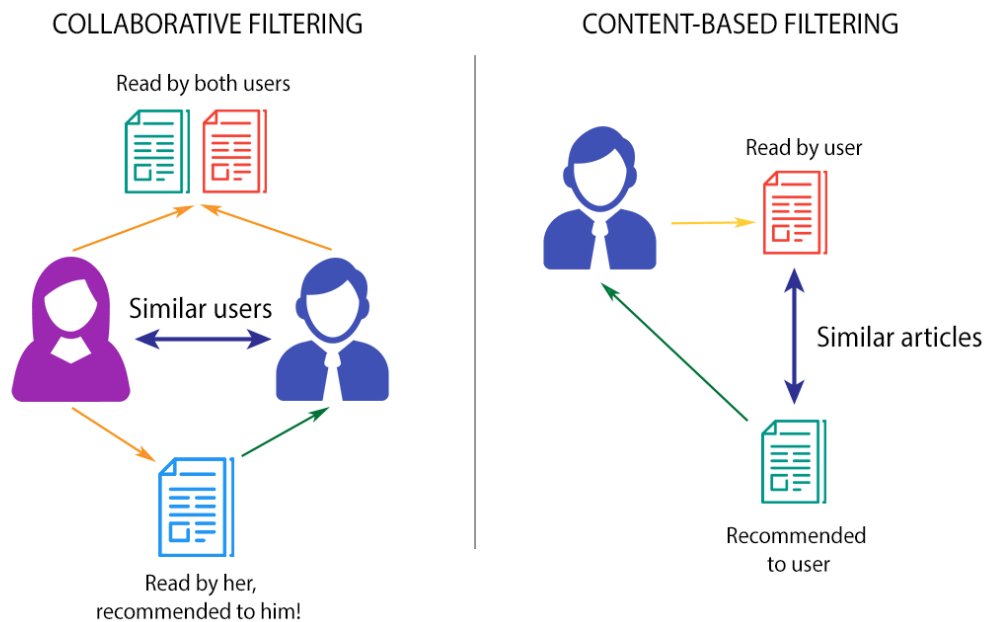


Figure 13: Recommendation engine techniques

- **Item-to-item collaborative filtering**

Amazon used both the approaches to create its own recommendation engine called "item-to-item collaborative filtering". This algorithm provides three functionalities such as operates in real-time, scales to massive data sets and generates high-quality recommendations. This algorithm matches each of the users bought and rated items to similar items then combine those similar items into a recommendation engine.

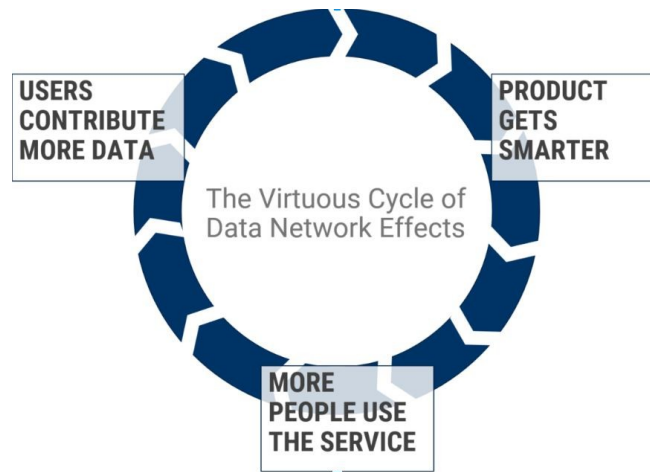


Figure 14: Data usage cycle. Figure 13 and 14 are taken from: “(1) Amazon’s Recommendation Engine Secret Sauce | LinkedIn.” Accessed May 29, 2019. <https://www.linkedin.com/pulse/amazons-recommendation-engine-secret-sauce-mario-gavira/>

Amazon works in a data feedback loop. The firm utilizes the data as provided by its customers such as their personal information when they create an account and purchase history as they buy products. As more and more people start using the website, they contribute more data and the product such as recommendation engine gets smarter to predict what the customers would want or like.

Figure 15.1 illustrates a sequence of steps performed by the recommendation process to generate recommendations whereas Figure 15.2 illustrates steps to generate a similar items table. From figure 15.1, the first step of the process involves finding a set of items that could be of interests to the users. In addition, similar items list and table are built. The next step includes to weigh the items by multiplying them with the commonality index. The list is sorted, and top M items of the recommendation lists are returned as one or more web pages to the user.

Figure 15.2 illustrates sequence of steps to create similar items table. Here, purchase histories of all the customers are retrieved. Temporary tables 102A and 104A are built which maps items to the customers that purchased those items. In step 106, popular items are selected based on a threshold. Common customers between popular item and other item are counted and commonality index is computed. Table 108A, stores other items and their associated commonality indexes which are then sorted and truncated to length N to generate the similar items list. Commonality index can be computed by using the following formula:

$$CI(\text{item}_A, \text{item}_B) = \frac{N_{\text{common}}}{\sqrt{N_A \times N_B}}$$

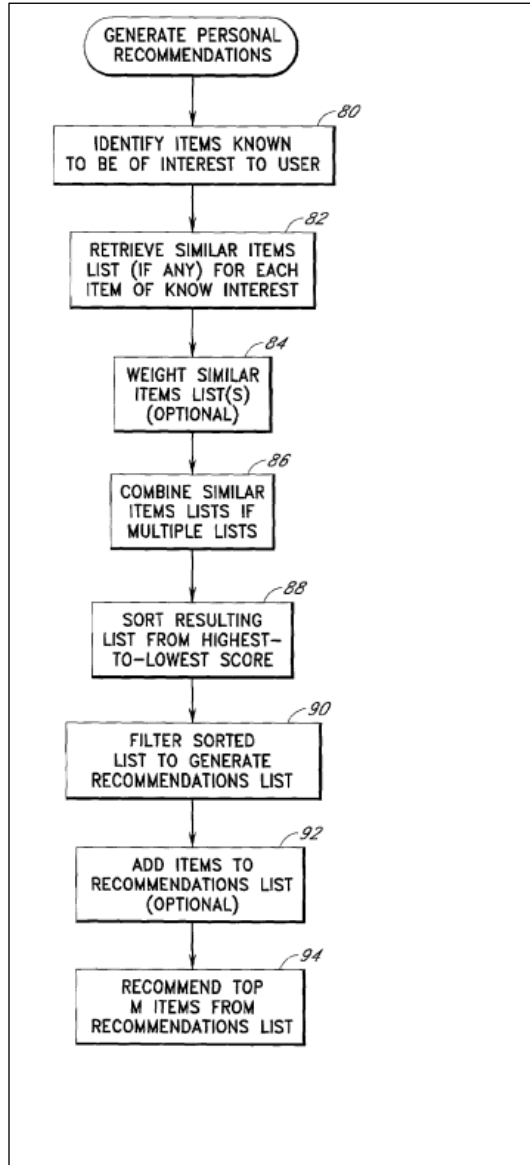


Figure 15.1: General Recommendations

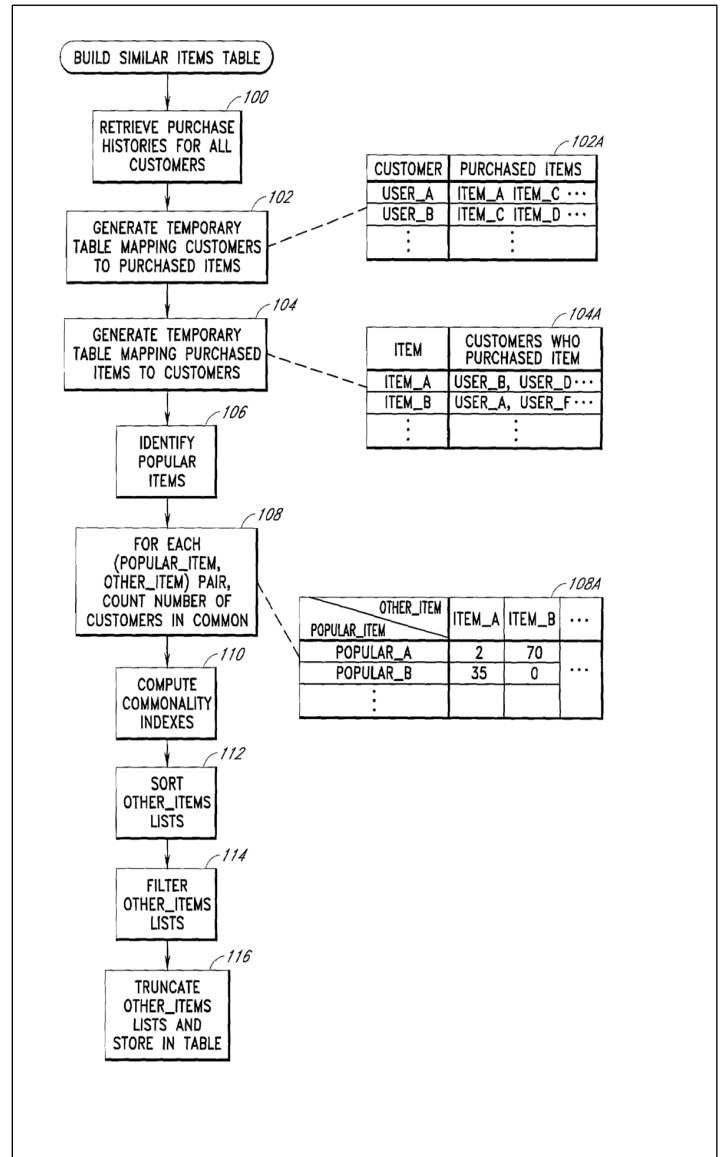


Figure 15.2: Similar items table

Figures 15.1 and 15.2: Recommendation engine algorithms. The above figures are taken from Jacobi, Jennifer A, Eric A Benson, and Gregory D Linden. "(54) PERSONALIZED RECOMMENDATIONS OF ITEMIS REPRESENTED WITHIN A DATABASE," n.d., 20.

7.3 AN EXAMPLE OF A RECOMMENDATION ENGINE: A trivial recommendation engine is built which uses features such as average review rating and the number of reviews to display products with similar product names. A recommendation engine of Amazon cannot be replicated using this dataset therefore, this engine is built on customers feedback to recommend similar products.

Approach 1: This approach is based on the **products**. There are two features considered here such as the number of reviews and average review rating. The below figures display results where average review rating ≥ 4.9 and number of reviews > 1 .

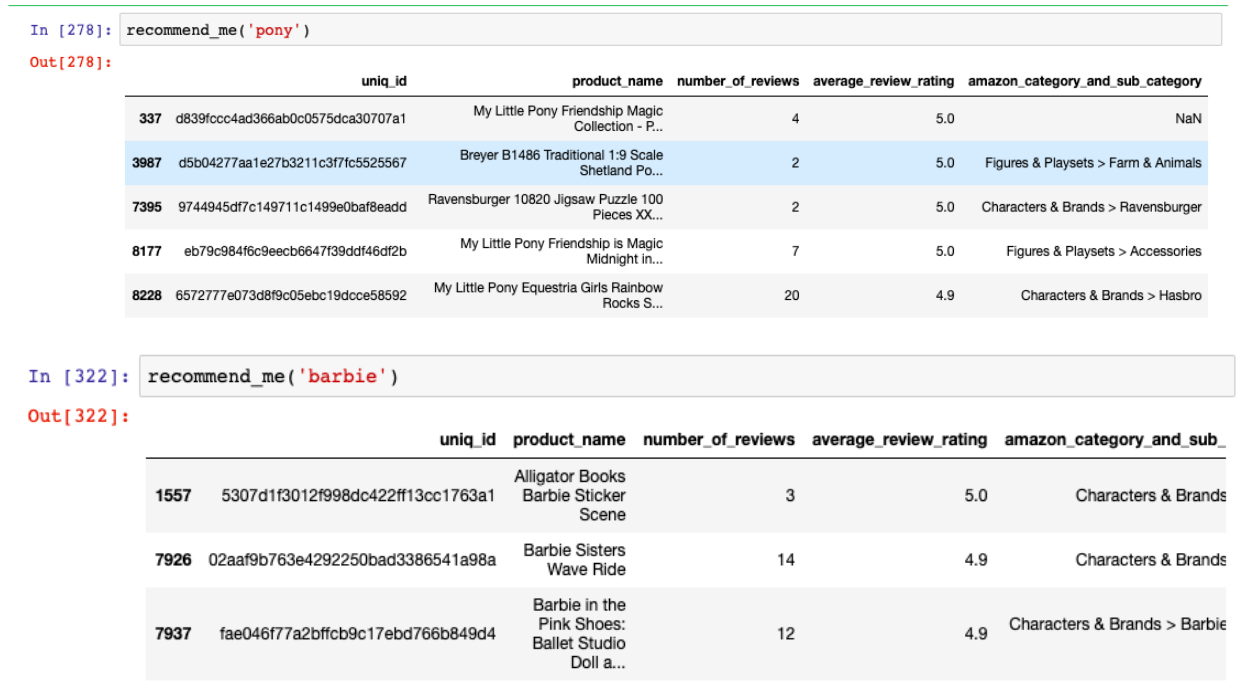


Figure 16: Approach 1 results

Approach 2: In this approach, the average review rating greater than or equal to 4.9 and the maximum number of reviews are considered. Here, only one product is recommended based on the condition of the maximum number of reviews. For instance, when the keyword “power rangers” is passed to the function, the engine returns a product called *mighty morphin power ranger legacy dragon dagger* with average review rating as 5.0 and number of reviews as 15.


```

In [357]: recommend_me('Spider')
Out[357]:


|      | uniq_id                          | product_name                                       | number_of_reviews | average_review_rating | amazon_category_and_sub_category |
|------|----------------------------------|----------------------------------------------------|-------------------|-----------------------|----------------------------------|
| 6492 | a0ec0b6c24dfa94406e140676548395f | The Amazing Spider-man WEB BATTLEERS Green Gobl... | 8                 | 4.9                   | Characters & Brands > Hasbro     |



In [358]: recommend_me('Star Wars')
Out[358]:


|      | uniq_id                          | product_name                 | number_of_reviews | average_review_rating | amazon_category_and_sub_category       |
|------|----------------------------------|------------------------------|-------------------|-----------------------|----------------------------------------|
| 8973 | d78173891efc811ca75e722d47cb16b0 | LEGO Star Wars 75050: B-Wing | 29                | 4.9                   | Characters & Brands > Star Wars > Toys |



In [360]: recommend_me('power RANGERS')
Out[360]:


|      | uniq_id                          | product_name                                      | number_of_reviews | average_review_rating | amazon_category_and_sub_category |
|------|----------------------------------|---------------------------------------------------|-------------------|-----------------------|----------------------------------|
| 8230 | f59a78feab8eb8c0843ca6921b259f9c | Mighty Morphin Power Rangers Legacy Dragon Dagger | 15                | 5.0                   | Figures & Playsets > Accessories |



In [361]: recommend_me('CAPTAIN AMERICA')
Out[361]:


|      | uniq_id                          | product_name                                      | number_of_reviews | average_review_rating | amazon_category_and_sub_category |
|------|----------------------------------|---------------------------------------------------|-------------------|-----------------------|----------------------------------|
| 4397 | 2163e472841204896986ba134f85adf5 | Captain America Super Hero Squad Soft Plush To... | 9                 | 5.0                   | NaN                              |



In [364]: recommend_me('HARRY POTTER')
Out[364]:


|      | uniq_id                          | product_name                            | number_of_reviews | average_review_rating | amazon_category_and_sub_category          |
|------|----------------------------------|-----------------------------------------|-------------------|-----------------------|-------------------------------------------|
| 2585 | 69e33bb775e4381742a14f38bfbf5eff | LEGO Harry Potter 4709: Hogwarts Castle | 8                 | 4.9                   | Characters & Brands > Harry Potter > Toys |


```

Figure 17: Approach 2 results

Approach 3: This engine recommends similar products based on **the manufacturer** and considers only the maximum number of reviews. As it is necessary to take multiple features into consideration because there could be cases when the average review rating is 5 but the number of reviews is only 2. In that case, the rating couldn't be given equal importance as the rating is biased. Therefore, this approach results in only one recommendation based on the manufacturer. From section 7.1, we know that LEGO is the top manufacturer so we will pass that into the function.

```

In [189]: recommend_me('lego')
Out[189]:


|      | uniq_id                          | manufacturer | product_name                           | number_of_reviews | average_review_rating | amazon_category_and_sub_category       |
|------|----------------------------------|--------------|----------------------------------------|-------------------|-----------------------|----------------------------------------|
| 2533 | 35353320134e93e3e4ff8f3ef027d1b7 | LEGO         | LEGO Star Wars 75038: Jedi Interceptor | 133               | 4.7                   | Characters & Brands > Star Wars > Toys |


```

Figure 18: Approach 3 result

Approach 4: The final approach is based on the **product categories**. From section 7.1, Vehicles and trains came out as the categories with maximum products. Here, the condition is based on the average review rating greater than 4.9 and the number of reviews greater than 10. Below two figures show the examples of this approach:

```
In [181]: recommend_me('vehicles')
```

```
Out[181]:
```

	product_name	manufacturer	category	number_of_reviews	average_review_rating
8441	Welly Back To The Future Part 1 DeLorean Time ...	filmwelt-shop	Vehicles	22	4.9

Figure 19: Approach 4-most popular category

```
In [183]: recommend_me('trains')
```

```
Out[183]:
```

	product_name	manufacturer	category	number_of_reviews	average_review_rating
0	Hornby 2014 Catalogue	Hornby	Trains	15	4.9
5777	Branching Out City of London Wooden Train Set	Branching Out	Trains	14	4.9
7860	Thomas Take n Play Ferdinand	Thomas & Friends	Trains	25	4.9

Figure 20: Approach 4 result- toy category

Amazon's vision is that recommendation engines will move beyond searching, clicking, and buying and hence will become like talking to a friend who knows your interests and anticipates your needs.

There are a few things that can be learned from Amazon's recommendation engine:

- Product recommendations are a great way to sell bulk products together. Recommending a group of items that customer might buy as a bundle is a great way of maximizing order.
- Exploring complementary products by using names of the recommendation engine is important.
- Using purchasing history as a way to provide a recommendation. A new member would be provided with best deals instead of recommendations based on history.
- Algorithms may recommend products that might be of no interest to the customers, therefore, offering feedback is crucial. With products, Amazon informs customers of the reason for a recommendation as well.
- Real-time recommendations analyze what customers are clicking on. Real-time recommendations can provide instant products based on what they want to purchase.

CHAPTER-8

OUTCOME OF THE RETAIL SHIFT

8.1 TOYS R US

Toys “R” Us started in 1948 by Charles Lazarus after World War II. It was called a firm that completely dominates its retail category and drives all of its competition out of business. The company became a Wall Street favorite and was named as one of the New York Stock Exchange's hottest stocks. At its peak, the firm offered a ‘pile them high’ approach that offered customers a huge choice of products with multiple brands. But as competitors such as Walmart, Target, and Amazon entered the fray, Toys R Us suffered and the market share shrank. Investors burdened Toys R Us with massive and increasing amounts of debt. The debt burden meant that the firm wasn't able to make the switch to digital quickly enough to offset the Amazon and Big Box effect, in part because it was paying off debt and carried interest out of declining cash flow. The combination of debt and inability to respond to threats in a post-Recession environment led to the slow but steady decline of Toys R Us.

Toys R Us signed a 10-year contract with Amazon to be the exclusive vendor to sell its products exclusively in 2000 but Amazon despite the deal allowed other toy sellers to sell their products on the e-commerce giant to expand and increase profits. As a result, Toys R Us sued Amazon to end the agreement in 2004 and missed the chance to use Amazon to sell its products online. This was one of the reasons that led to the fall of the firm. Firm neglected the importance of online presence which proved to be disastrous for the retailer. Amazon countersued citing a “chronic failure” by Toys R Us to keep items in stock. The decision of the New Jersey court was that Amazon had violated the agreement and damaged Toys R Us’ exclusive position and capability to plan strategies.

Amazon settled the long-standing legal dispute with Toys R Us in 2009 and paid the firm \$51 million. The deal had an early blow to the company's digital efforts, it was relying on Amazon instead of creating its own e-commerce platform and identity. Amazon, Target, and Walmart offered discounted products especially during the holiday season when Toys R Us used to make the maximum profits. Toys R Us couldn't compete with the low prices and therefore was

led behind in the race of retailers. This era has not been good for traditional retail stores. In 2017, there were 18 high-profile retail bankruptcies and in 2018, there were 13 major bankruptcies filed. Some of them were: Sears, Mattress Firm, Brookstone, National Stores Inc., Claire's, Nine West Holdings, The Walking Company, etc.

Efforts by Toys R Us to reform its in-store and online experience:

- The firm tried to revamp stores to enhance the in-store experience.
- It tried price-matching online holiday deals from Amazon and other retailers, in an attempt to win back customers from its competition.

What began as a single DC-based store for cribs and strollers, eventually became a massive big-box chain and a symbol of American retail. Some of the reasons that led to the bankruptcy of Toys R Us are the following:

- The stores were huge, full of inventory
- Products were badly merchandised
- Customer service was nonexistent
- Weak in providing the online shopping experience
- Digitalization influenced kids and parents to interact online rather than continuing traditional shopping
- With big retail giants as competition, it has become really difficult for a brick-and-mortar store to innovate and offer the same level of service as the giants are offering
- Comparing the value proposition of Toys R Us with Amazon, we can clearly come to the conclusion that even though Toys R Us offered low prices, and had a vast selection of toys it lagged behind in the fast delivery speed. Toys R Us did make an effort to sell all of its products on Amazon but it didn't end well for the firm.

According to me, it was a good move from Toys R Us that it signed an exclusive contract with Amazon but when things didn't work out with Amazon. The firm should have tried to come in a contract with Walmart or Target to have an exclusive section in their stores with only Toys R Us products. Although after a failed agreement with Amazon, Toys R Us tried to sell the products online and reported good sales also. That didn't last long because of other retail giants moving faster than Toys R Us. Amazon was expanding in Prime with a vast selection of products. It

became the go-to site for shopping and led to the fall of many retailers who couldn't compete with the giants.

8.2 RISKS FACTORS FOR AMAZON

1. **International operations-** It is expensive to establish, develop, and retain operations and stores internationally. Operating internationally may lead to local and economic conditions, government regulations, restrictions on sales or distribution of products or services, limited, and technology infrastructure, or negative impact on cash flow. There could be difficulty in staffing, developing, and managing foreign operations or increased payment risk.
2. **The strain on operations-** Seasonality may affect operations of a firm. There could be issues such as overstocking, less demand, understocking when increased demand may result in lower sales and profits. There could be system interruptions if too many people try to access the website at the same time. Issues such as changes in foreign rate fluctuations, downtimes, disruptions in service by shipping carriers affect operations of Amazon.
3. **Cybersecurity-** There is a large amount of data processed, stored, and transmitted including personal information of customers such as credit card information, address, phone number, and date of birth which leads to the risks of security breaches. Such breaches could expose Amazon or its customers to loss or misuse of information. Although there are enough measures taken for the security of its customers, vendors, or the firm's data, such measures cannot provide enough security.
4. **Inventory risk-** Seasonality, new product launches, changes in pricing, changes in consumer demand and spending patterns could lead to inventory risks. These changes should be monitored to avoid overstocking or understocking products. These inventory risks can affect the operating results of the firm.
5. **Competition-** In 10-Q of 2019 Quarter 1 results, Amazon mentioned that its business faces intense competition in different sectors such as web, electronic devices, e-commerce services, and cross-border competition. It also mentioned that the internet facilitates competitive entry and comparison shopping, therefore, increased competition reduces sales and profits.

CHAPTER-9

CONCLUSION AND FUTURE SCOPE

In conclusion, Amazon's retail strategy is pushing the traditional brick-and-mortar retailers to innovate and compete with each other. The retail giant has been shifting the way retail works using technology and big data for the benefit of its users. Amazon's services such as Marketplace platform are helping small businesses to expand and grow, and every strategy of the firm is focused on its customers. In order to take the best decisions for the customers, it is necessary to utilize customers data and create actionable insights about what customers want. The recommendation engine built using toy products data would add value to the previous works done on the dataset on the Kaggle platform. The insights of this niche market gained from the data analysis will prove beneficial not only to Amazon but also to the manufacturers and suppliers of toy products.

Finally, because of the shift in retail mainly caused by the leader, Amazon there are firms who have gone bankrupt and many who are struggling to cope up with the retail apocalypse. Toys R Us is one of the popular retail firms that went bankrupt therefore, the last chapter highlighted some of the reasons for its demise. Other retail firms can learn a lot from both the firms as one is still the leader and another that was very successful but went bankrupt.

FUTURE SCOPE

This case study can be utilized to increase the knowledge of the Amazon and how it implements the customer focus strategies to gain a competitive advantage. The recommendation engine built using toy products data of Amazon can be improved using open source algorithms by AWS. Sentiment analysis on customers reviews can be performed to understand customers feedback on the products which can prove to be beneficial to know the customers better and the results can be used to predict the negatives and positives about the products. This analysis would improve the products sold on Amazon and will keep the customers loyal and happy.

REFERENCES

- Sorescu, Alina, Ruud T. Frambach, Jagdip Singh, Arvind Rangaswamy, and Cheryl Bridges. "Innovations in Retail Business Models." *Journal of Retailing*, Innovations in Retailing, 87 (July 1, 2011): S3–16. <https://doi.org/10.1016/j.jretai.2011.04.005>.
- "Exploring Toy Products on Amazon | Kaggle." Accessed May 25, 2019. <https://www.kaggle.com/residentmario/exploring-toy-products-on-amazon/data>.
- "Amazon's Recommendation Engine Secret Sauce | LinkedIn." Accessed May 29, 2019. <https://www.linkedin.com/pulse/amazons-recommendation-engine-secret-sauce-mario-gavira/>.
- "Amazon's Recommendation Engine: The Secret To Selling More Online." Accessed May 29, 2019. <http://rejoiner.com/resources/amazon-recommendations-secret-selling-online/>.
- "Inside the 20-Year Decline of Toys R Us." Retail Dive. Accessed May 25, 2019. <https://www.retaildive.com/news/inside-the-20-year-decline-of-toys-r-us/526364/>.
- Bozkurt, Çağlar. "Amazon's Retail Expansion Strategy." Accessed May 25, 2019. <https://www.twentify.com/blog/amazons-retail-expansion-strategy>.
- "Amazon's Giving Away the AI Behind Its Product Recommendations | WIRED." Accessed May 25, 2019. <https://www.wired.com/2016/05/amazons-giving-away-ai-behind-product-recommendations/>.
- "Amazon CEO Jeff Bezos Highlights The Customer-Centric Retail Strategy." Stella Pulse, September 18, 2018. <https://stellapulse.com/2018/09/18/amazon-ceo-jeff-bezos-highlights-the-customer-centric-retail-strategy/>.
- "Learn What the Exponential Elements Are in the Business Model of Amazon." Business Models Inc. Accessed May 29, 2019. <https://www.businessmodelsinc.com/exponential-business-model/amazon/>.
- Radio, Business, Podcasts, and North America. "The Demise of Toys R Us: What Went Wrong." Knowledge@Wharton. Accessed May 25, 2019. <https://knowledge.wharton.upenn.edu/article/the-demise-of-toys-r-us/>.
- Grewal, Dhruv, Anne L. Roggeveen, and Jens Nordfält. "The Future of Retailing." *Journal of Retailing*, The Future of Retailing, 93, no. 1 (March 1, 2017): 1–6. <https://doi.org/10.1016/j.jretai.2016.12.008>.
- "These Were 2018's Top Selling Product Categories at Amazon and eBay." Accessed May 29, 2019. <https://trends.edison.tech/research/2018-ebay-vs-amazon.html>.
- "What Amazon Key Teaches Us About Trust In Customer Relationships." Accessed May 25, 2019. <https://www.forbes.com/sites/anthonymsmith/2017/11/16/what-amazon-key-teaches-us-about-trust-in-customer-relationships/#79418d3777d0>.
- Drexel University, and David Gefen. "Customer Loyalty in E-Commerce." *Journal of the Association for Information Systems* 3, no. 1 (2002): 27–53. <https://doi.org/10.17705/1jais.00022>.

Bird, Jon. "With 100 Million Members, It's An Amazon Prime Planet." *Forbes*. Accessed May 30, 2019. <https://www.forbes.com/sites/jonbird1/2018/04/19/with-100-million-members-its-an-amazon-prime-planet/>.

Danziger, Pamela N. "Thinking Of Selling On Amazon Marketplace? Here Are The Pros And Cons." *Forbes*. Accessed May 30, 2019. <https://www.forbes.com/sites/pamdanziger/2018/04/27/pros-and-cons-of-amazon-marketplace-for-small-and-mid-sized-businesses/>.

Mahadevan, B. "Business Models for Internet-Based E-Commerce: An Anatomy." *California Management Review* 42, no. 4 (July 1, 2000): 55–69. <https://doi.org/10.2307/41166053>.

Ritala, Paavo, Arash Golnam, and Alain Wegmann. "Coopetition-Based Business Models: The Case of Amazon.Com." *Industrial Marketing Management*, Special Issue on Co-opetition Cooperation and Competition, 43, no. 2 (February 1, 2014): 236–49. <https://doi.org/10.1016/j.indmarman.2013.11.005>.

Laudon, Kenneth C, and Carol Guercio Traver. "Copyright © 2007 Pearson Education, Inc.," 2007, 29.

"Four Keys to Amazon's Marketing Success (and How to Improve Them)." Accessed May 30, 2019. <https://www.annexcloud.com/blog/four-keys-to-amazons-marketing-success/>.

"Amazon CRM Strategy: 4 Lessons for E-commerce Sites." Accessed May 30, 2019. <https://www.channelreply.com/blog/view/amazon-crm-strategy>.

"Strategic Business Models: Engineering Management Journal: Vol 14, No 1." Accessed May 30, 2019. <https://www.tandfonline.com/doi/abs/10.1080/10429247.2002.11415145>.

Enders, Albrecht, and Tawfik Jelassi. "The Converging Business Models of the Internet and Bricks-and-Mortar Retailers." *European Management Journal* 18, no. 5 (October 1, 2000): 542–50. [https://doi.org/10.1016/S0263-2373\(00\)00043-8](https://doi.org/10.1016/S0263-2373(00)00043-8).

"4 Ways to Align CRM Strategy with Your Amazon Business." SellerEngine, September 24, 2015. <https://sellerengine.com/4-ways-to-align-crm-strategy-with-your-amazon-business/>.

"How CRM Can Help Multichannel Amazon Sellers Can Get Past the Data Hurdle | Virtual-Strategy Magazine." Accessed May 30, 2019. <https://virtual-strategy.com/2017/05/11/how-crm-can-help-multichannel-amazon-sellers-can-get-past-the-data-hurdle/>.

APPENDIX

As part of Chapter-7, below is the general information regarding the steps performed to do the data analysis:

DATA SOURCE: The dataset was extracted from Amazon.com and is available on Kaggle. Kaggle is an online community of data scientist and machine learners owned by Google LLC which provides services such as machine learning competitions, Kaggle kernels, Kaggle learn, and job boards.

FEATURES

Product Name	Average review rating
Manufacturer	Amazon category and subcategory
Price	Customers who bought this item also bought
The number available in stock	Items customers buy after viewing this item
Number of reviews	Product description and information
Number of answered questions	Customer questions and answers
Customer reviews	Sellers

SOFTWARE: Quick sight is used to analyze the data and create visualizations. Python 3.0 and IDE Jupyter notebook are used to build the recommendation engine

PYTHON PACKAGES: Below packages are used for data analysis:

- NumPy- used for mathematical functions to operate on arrays
- Pandas- used for data manipulation and analysis
- Matplotlib- this package is used to create two-dimensional diagrams and graphs
- pyLDAvis- used for interactive topic model visualization

DATA PREPROCESSING: Preprocessing is a technique of data mining where real-world data which is inconsistent is cleaned. Raw data is taken, and preprocessing steps are applied to the data to prepare it for machine learning models or data analysis. In this dataset below steps were done as part of the data preprocessing:

- Missing values were checked and filled with NA or 0
- Data types of variables were checked
- Data types were converted according to 'pandas' library
- Feature engineering was used to extract categories feature and a new feature was built called Category 4 that displays toy categories.