

**MARKETING IMPLICATIONS OF UTILIZING
AUGMENTED REALITY FOR
IN-STORE RETAILING**

by

Race Collins

**Submitted in partial fulfillment of the
requirements for Departmental Honors in
the Department of Marketing
Texas Christian University
Fort Worth, Texas**

May 6, 2019

**MARKETING IMPLICATIONS OF UTILIZING
AUGMENTED REALITY FOR
IN-STORE RETAILING**

Project Approved:

Supervising Professor: Stacy Grau, Ph.D.

Department of Marketing

Michael Sherrod, MBA

Department of Entrepreneurship and Innovation

ABSTRACT

Augmented reality (AR) is an emerging technology set to disrupt in-store retail. AR is defined as a digital overlay on top of the real world, consisting of computer graphics, text, video, and audio, which is interactive in real time. The purpose of this paper is to provide ideas and concepts for how AR will impact in-store retail and present the benefits and downfalls of how this emerging technology will influence retail. The method used is a literature review with research conducted using books, academic journals, and articles that serve to back up the arguments throughout the paper. There are several key findings. First, Amazon will bridge the retail “chasm” by 2020 and will spark a wave of technological changes in retail stores using technologies such as AR, AI, and smart sensors. Second, key factors for retail stores implementing AR are simplicity, customer-orientated, contextually relevant, the hook model, and focusing on experience and discovery. Third, AR in retail stores can be classified and better utilized with the Experiential-Discovery Retail Model (EDRM), which can help retail stores focus their AR marketing efforts. Lastly, data will be the biggest challenge for AR because it presents more opportunities for hacking, mismanaging of data, and what to do with the data. Augmented reality will be an essential medium in marketing for retail stores. Retail stores will need to experiment with AR to optimize the effects of marketing metrics and creating better customer satisfaction.

I. INTRODUCTION

Topic

The main topic in this thesis is how retail stores can effectively integrate augmented reality (AR) to reach their goals. Technologies such as the iPhone have brought a new wave of consumers who always have access to shop (Newport, 2019). The retail industry has experienced a decline in sales from online stores such as Amazon, however, retail will catch up from a revolution sparked by emerging technologies such as AR, artificial intelligence, and blockchain. These emerging technologies will be significant for retail stores, and to limit this thesis, I will only be discussing the impact of AR. My mission with this thesis is to educate marketers, businesses, and consumers on AR for its significance and how marketers can utilize it to create value to shoppers and communities.

Previous Research on Topic

There is widespread information on this topic through books, articles, and journals. One of the most popular marketing books, *Crossing the Chasm* by Geoffrey Moore, is about marketing emerging technologies. *Augmented Human* by Helen Papagiannis discusses how humans will be impacted with AR and include an entire section on shopping experiences. Furthermore, articles and journals are coming out every day about how businesses are using AR in their retail stores. AR is an emerging technology that is becoming a hot topic because we are beginning to have the technological capacity to support mass adoption of this technology.

The 'Gap'

My thesis can be categorized as the culmination of marketing, retail, and augmented reality. There is an abundance of information on these topics individually however, I will be using a culmination of sources, and a unique perspective to think about this topic differently. It is important to look at things differently because a gap exists between our current understanding of how AR will impact our world and what will become reality. I want to help bridge that gap through my research and thesis. Similar to when the internet and smartphones were introduced, AR is an emerging technology that we know will have a massive impact, but we are unsure exactly how it will happen

The primary audience for this paper is retail marketers who want to understand the emergence of this important marketing medium and how they can implement it into retail stores. However, secondary audiences, such as consumers and entrepreneurs, can also gain utility. Consumers will have a greater understanding of emerging technology and how it will benefit them. Entrepreneurs and corporate executives will understand how to implement AR in their retail stores and how it could affect sales, profits, and customer lifetime value.

Research Questions

There are four research questions that guide the research on this topic.

Research question #1: how, when, and by whom will retail change?

This research question is extremely important because it helps to understand the future of AR and retail. Without doing this section would be like going to a new place without any map or direction. Therefore, the answer to this question will help clarify the current landscape by looking at trends as well as predictions from retail and AR experts. It is important to figure out if

there is a major force that could change the retail industry from emerging technology and, if so, when and how it would occur. As described by Clayton Christensen in his book *The Innovator's Dilemma*, new technologies can emerge at unexpected times and it is important to have a holistic understanding of an industry to be prepared for major changes. Understanding this research question is the foundation for the effectiveness of the following research questions.

Research question #2: What are the most important aspects of marketing AR, which stores are best suited for AR, and can all retail stores implement this technology?

As a new marketing medium, AR has pros and cons that will include many opportunities. Therefore, it is important to first evaluate what aspects of AR are similar to marketing mediums that are currently in the market and how this can be transferred to marketing AR. The uniqueness of AR and evaluating the benefits and downsides that this emerging technology brings is essential for marketers to understand to implement into their businesses. This research question helps in understanding the most important aspects of marketing AR and how to utilize the strengths that this emerging medium presents. These questions will serve to help in understanding if there are particular retail stores that are best suited for AR.

Research Question #3: Who is the target market for AR in retail stores and why?

The answer to the previous research question will help to identify optimal users of AR in retail stores. I want to figure out whom this technology is best suited for through demographics, psychographics, behavior, influence, and other relevant factors to create a target market optimized for AR users in the retail industry.

Research Question #4: What are the biggest challenges and risks of marketing AR?

A well-rounded thesis on AR would not be complete without diving into the ethical implications of marketing AR and the potential issues or challenges that organizations may face with this technology. I have saved this research question for last because answering my previous research questions gives a holistic understanding of these ethical considerations. It is important for organizations to consider this research question because it may help to clarify if this technology should be implemented or how to mitigate risks through preparation.

Outline

The literature review is split into five sections and takes up the majority of the thesis. The first section will discuss the terminology of augmented reality versus other emerging technologies such as virtual reality. The second section shows trends in AR through industry forecasts, consumer adoption rates, and consumer shopping trends. The third section is how Amazon will change the retail industry because of its technologically advanced retail stores that will be implemented in 2021. The fourth section introduces five key factors for marketing AR in retail stores, the experiential discovery retail model, and the importance that in-store heuristics will become with AR. Afterward, I will propose the target market for this emerging technology. The fifth section of the literature review is the marketing challenges and risks of AR in retail stores. After my literature review, I will discuss the methodology, implementation, and conclusion.

II. LITERATURE REVIEW

Propositions

1. Amazon will bridge the AR retail “chasm” in 2021.
2. Market AR using the Experiential Discovery Retail Model (EDRM).

3. The key target market is connected millennials in big urban cities.
4. Data-privacy conundrum will be the biggest AR challenge for marketers.

Section 1 - AR and its Significance

In evaluating how society has changed during the past 100 years, it is apparent that the world has been dramatically impacted by technology. Technology continues to increase at an exponential rate, and some experts believe technologies such as 5G (Dohler, 2018) and EUV lithography (Shoot, et. al, 2018) are expected to keep Moore's law alive until the next decade. Companies lacking adaptation to changing technology will almost certainly go out of business because consumers will choose to spend their money on competitors' products or services. While technology has impacted almost every industry, a focus has been placed on how retail stores will be impacted because it provides unique advantages that will work with to create an omnichannel experience to enrich the customer experience. (Schaverien, 2018).

The Definition and History of Augmented Reality

In 1990, Boeing engineer, Tom Caudell coined the term "augmented reality" to describe a digital display for aircrafts to blend digital overlays on top of the real world (Cassella, 2018). However, for computer science, the definition of AR is similar but more detailed. The definition of AR that has been widely used and accepted since 1997 is from AR pioneer, Ronald Azuma, who explained that "AR allows the user to see the real world with virtual objects superimposed or composited with the real world. Therefore, AR supplements reality, rather than completely replacing it." (Azuma, 1997). This definition has been accepted and rarely modified as it is succinct yet broad enough to allow various mediums to become popularized. This definition of

AR accepts any technology that has digital overlay displayed on top of the real world, which can consist of computer graphics, text, video, and audio that is interactive in real time. (Papagiannis, 2017). AR is different from virtual reality because AR displays digital information on top of the real world whereas virtual reality (VR) only shows a digital world without any inclusion of the real world.

The three main criteria for a technology to be considered AR are the following:

- Combines real and virtual objects in a real environment
- Interactive in real time
- Registers real and virtual objects in three dimensions (3D)

The outcome of AR is known but how this technology will be popularized is still a mystery.

This technology could become popularized through a smartphone, tablet, computer, or AR eyewear equipped with software and a camera (Papagiannis, 2017). For mass commercialization of AR to occur, it is important to think of why the smartphone became popularized. First, it is universal because almost every individual can hold the phone and start using it. Second, it should be easy to use and simple. Third, price points and high switching costs are important to keep a consumer loyal to a brand or product. Fourth, it needs to add more value to consumers than previous methods or technology. Fifth, the technology must be reliable and seamlessly integrate with the real world. AR glasses and contact lenses are widely held to be the future of AR, however, because not everyone uses glasses or contact lenses, it will inhibit consumer adoption. My subjective belief is that nanotechnology will create mass-adoption of augmented reality and be the successor to the phone because it will provide each of these criteria and be relevant to mass consumers in the next 10-20 years.

There are three eras for augmented reality (Isberto, 2018). Augmented Reality was first developed in 1968 when a Harvard professor and student invented a head-mounted display hung from the ceiling that allowed users to see a computer-generated display, which made them feel like they were in an alternate reality. While this technology is closer to VR than AR, it was an extremely important advancement to both technologies. This sparked the development phase of AR in improving the technology and lasted between 1968 to 1998. The second era occurred between 1998 and 2012 when companies started becoming the primary users of AR and used the technology for digital overlays. For instance, in 2003 the NFL introduced the 1st and 10 lines on TV to help viewers visualize the distance to the first down. The current era of AR began in 2012 when companies began using AR hardware and software for consumers. A popular example was Google Glass, an augmented reality headset for consumers, that was introduced in 2012. Another example is Apple ARKit, which is Apple's augmented reality development platform for IOS apps, and the largest AR platform in the world (Margaret, 2017). ARKit has substantially increased the number of AR apps on the app store and raised consumer awareness of this technology by enabling most iPhones the power of harnessing AR.

The Rise in Mobile and Augmented Reality

The excitement with augmented reality demonstrates individuals' and companies' belief that it will drastically change our world for the better. Nevertheless, little is known about the practice and effective execution of AR programs in the future (Scholz and Smith, 2016). Many of the world's largest companies, such as McDonald's, Coca-Cola, and GE, have implemented AR in their marketing campaigns. These companies have utilized AR to develop brand narratives and create space in ways that have never been used before (Scholz and Smith, 2016). Furthermore, the world's largest companies, including Apple, Facebook, Google, and Microsoft, are heavily

investing in this technology. As previously discussed, Apple released ARKit, which is set to drastically increase the number of AR apps in the app store. Mark Zuckerberg refers to AR as “a new communication platform”. He writes, “One day, we believe this kind of immersive, augmented reality will become a part of daily life for billions of people” (Zuckerberg, 2014).

The world is now ready for AR for two reasons. First, technology has only recently been able to meet the strict demands AR has on processing power. Second, affordable smartphones, as well as decreased poverty in developing countries have enabled communication and ‘always-on’ consumers across the world. Marketers will be presented with unique challenges to not only vie with competitors but also synergistically integrate AR along with online shopping to create a holistic experience. Ultimately, in-store retailing will be revolutionized, and the companies that can identify this trend and adapt to it will succeed, whereas the businesses that cannot, will be put out of business.¹

U.S. consumers spend more time with retailers online on smartphones and tablets than on desktops (Dusto, 2017). In 2017, 156 million Americans owned smartphones and 82 million own tablets, which are 24% and 57% annual increases, respectively. Furthermore, annual internet browsing on mobile devices increased by 359% versus 4% on desktops (Dusto, 2017). These are important trends to consider because mobile allows consumers to be ‘always-on’ by becoming accustomed to shopping throughout the day. Consumers greatly prefer apps to mobile websites because the apps are easier to browse through (ClickLabs, 2014). Moreover, **Exhibit 1** shows that over a third of the world population is projected to own a smartphone by 2019, which is up

¹ This concept was demonstrated in the book *The Innovator's Dilemma* by Clayton Christensen in which he describes the difference between sustainable and disruptive technology. He provides research for why existing companies can adapt to sustainable technology. However, disruptive technology can catch large companies off-guard and help startups to displace them.

from 21.6% in 2014. The rapid and widespread adoption of smartphones across the world presents an excellent opportunity for AR.

Goldman Sachs predicts that AR will be an \$80 billion industry by 2025 by generating \$45 billion from hardware and \$35 billion from software (Weinswig, 2016). However, Tim Merel, Managing Director of Digi Capital, believes the industry will grow much faster and expects the market to reach \$120 billion by 2020 (Weinswig, 2016). Regardless of these predictions, it is unquestioned that AR will become an extremely large industry with a rapid growth rate as shown in **Exhibit 2**. **Exhibit 3** demonstrates that video games will be the main factor for AR growth, which is expected to have 34% of the market share by 2022. The world's largest companies are spending billions of dollars to become major players in this technology and will continue to spend money on it in the foreseeable future.

Section 2 - The Current Retail Landscape and How it will be Disrupted

While this section may initially seem like a superfluous extension, it is an integral part of understanding later explanations of how AR will be utilized in-stores. I believe the mass-adoption of AR will not occur until retail disruption occurs. As will be discussed later, retail disruption will allow greater access to emerging technologies while maintaining extreme customer-focus. Currently, there is too much resistance for customers to try new technologies, such as AR, to cross the chasm for most consumers. Our society is in an extremely unique transition period in which there will be fewer, more technologically advanced stores to create higher value retail stores that will coexist to make online shopping more powerful. To some, this

situation is a retail apocalypse, but to others, it is a transformation that will lead to an abundance of unique implications of technologies that will push humans forward.

The Retail Trend and Why there will be Fewer Stores in the Future

It is important to get one thing clear, there are way too many retail stores. Stores are closing at an incredible rate. According to Cushman & Wakefield, roughly 9000 major chains closed in the US in 2017 and a projected 12,000 more would be closed in 2018. (Wylie, 2018). The media often likes to mention the doomsday for retail stores and the dominance of online because of its incessant headlines about retail stores closing. In the span of just a few days in March 2019, Coresight Research noted that retailers have announced 4,300 store closings this year with notable announcements including closings for 230 Gap stores (about half its locations), 18 JC Penney stores, and 50 Victoria's Secret stores (Thomas, 2019). Doom and gloom make good headlines, but retail is going through a transition. Relevance is the key thing to consider when evaluating these store closings. Companies must deliver on customers wants and needs while standing out from the competition. The cause of this seismic shift in shopping habits is spurred from incredibly fast changes in technology and the value it provides. In the pre-connectivity era, consumers would have to go to the mall or local retail stores to get information based on what products to buy and would result in variability if they would like the product or not. To further elongate this process, consumers would often use catalogs for the discovery of products and ask friends as well as family for trustworthiness. Consequently, the time and effort it took to buy a new product could be considerable and ineffective for personal needs relative to today. E-commerce has expedited the shopping process drastically.

There are two important trends happening. First, millennials have drastically different spending habits and values than earlier generations. This is mostly because of increased student debt. Millennials under 25 put twice as much of their spending on educational spending as their parents, which has put a big burden on spending. (“Generations change how...”, 2016). Specifically, from 2005 to 2012, student debt for Americans under 30 increased from \$13,340 to \$24,897. The second trend is that consumers are spending less on clothing. In the UK in 2017, spending on women’s clothing dropped 3% while spending on entertainment in bars and restaurants increased by double-digit growth (Next PLC, 2017). Furthermore, according to Steve Rowe, CEO of Marks & Spencer (M&S), 60% of female shoppers have decreased spending on clothing compared to a decade ago. These trends have hurt malls, department stores, and superstores. Malls visits have decreased by 50% from 2010 to 2013.

These trends indicate there has been a shift in consumer shopping habits from material goods to experiential services such as travel, entertainment, and dining out. According to Sarah Quinlan, SVP of Mastercard, the top gift was a plane ticket followed by a hotel voucher. According to the US Census Bureau, 2015 was the first year ever recorded to have more spending on restaurants than bars and supermarkets. Consequently, these trends show that consumers have shifted their purchasing habits relatively quickly thanks to a frictionless experience of getting more stuff. With more availability online, the proximity of the store matters less. These trends indicate there will be drastically fewer retail stores and, as I will discuss later, retail stores of the future will provide unique advantages that will entice consumers into the store because of unique in-store advantages. The bottom line is, the retail store is not dead, but it will be drastically different than what we have become accustomed to.

Why Companies will go Online to Offline (O2O)

While the last section may have made retail stores seem to have a bleak future, it is important to note that 90% of all retail sales take place in-stores globally (Fitzgerald, 2018). Stores that do not have a physical presence along with an online store will be at an advantage in the future because it provides many key advantages. First companies can utilize **omnichannel integration**, which is the blend of online and offline commerce to provide customers with the unique advantages between these retail channel. Omnichannel integration combines the long-tail accessibility of the internet while interacting with products in real-time in-stores discovering new products.

Therefore a retail store could keep in-stock the best-selling products and 'showcase' products to be shipped or only do the latter option. Consumers can touch, feel, and try products before making a purchase, which could mitigate the major downfall of stores, which is not having enough inventory.

Omnichannel integration will allow easier product returns. This is an undervalued concept because the benefits for in-store customer returns are extremely rewarding. UPS showed research indicating that roughly two out of three shoppers who return a product in a store will purchase something while they are there (Ikea website, 2019). Furthermore, 60% of shoppers say they prefer to return items purchased online to physical retail stores. The last key advantage of physical stores is increased brand loyalty since brands can be a part of consumer's everyday life. There is something special that occurs when excellent customer service or physically being in a store can provide users to a brand. For instance, Starbucks is an experience that is part of people's everyday life and can increase the attraction to a brand. In addition, brands act as billboards to brands because it provides physical real estate that can remind customers about a brand, which helps to drive online sales. A study showed that internet sales go up more than 50%

within the first six weeks of a store opening and retailers with less than 30 stores have the most impact when opening a new store with web traffic boosting 84%.

O2O is a new concept in which online companies are going offline by expanding consumer possibilities to include omnichannel integration. One of the first and most notable companies that successfully did this was Warby Parker, an American eyewear company, which started online in 2010 and expanded to over 70 stores in just three years. After opening these stores, Warby Parker saw a drastic increase in online sales and profitability because the stores increase customer awareness. Other companies that done O2O include Casper (mattresses), Bonobos (men's fashion), and Harry's Razors. However, as will be discussed in the next section, retail will be completely disrupted when a behemoth of a company that sends shivers down the necks of any company when it enters any new industry, Amazon.

Why Amazon will Spark Retail Disruption

The book *Amazon* by Natalie Berg and Miya Knights analyzes dozens, if not hundreds, of reasons Amazon will lead the retail disruption. This section is much larger than just Amazon since it will cause seismic waves in the next few years, in which existing and new retailers will most likely jump on the Amazon Effect to bring consumers a new way of shopping with disruption occurring across the globe (Fourtané, 2018). This section is important because it gives marketers and other businesspeople incite into who will spark retail disruption when they will do it, and how it will happen. For the sake of time and space, I will discuss the three key reasons Amazon will spark retail disruption.

First, Amazon is a massive company with a lot of power. In 2018, it was worth more than the equivalent of Walmart, Home Depot, Walgreens, Target, Best Buy, Kohl's Macy's, Nordstrom, JCPenney, Sears, Costco, CVS, and Walgreens combined. Since the company started, it has expanded to more than 30 product categories and has over 100 million people paying \$100 per year to be a prime member. It is important to note that Amazon Prime is the glue to its ecosystem as consumers typically become lifelong customers after they sign up. Furthermore, Amazon is the starting point to more than half of all US consumers searching for products and accounts for 40% of sales that Americans spend online. Also, it was named the one app that millennials could not live without, which is important because these are typically the individuals who are early adopters and try products. These statistics show that Amazon has the money, energy, and resources to transform practically every industry it goes into.

Second, because Amazon accounts for around 40% of all online sales, they are experiencing much higher shipping and customer acquisition costs that can be mitigated with retail stores. According to AlixPartners, a \$100 clothing purchase would result in a profit margin of 32% in retail versus 30% online. In a three year span from 2014 to 2017, Amazon more than doubled its cost of sorting and delivering products to nearly \$22 billion. Retail stores would be a large piece of the puzzle because it gives customers a more convenient and cost-effective way to receive online orders (Berg 2019). However, Amazon is recognizing that customer acquisition is much higher without retail stores. In fact, buy-online and shipping to customer method make distribution costs almost four times higher than retail stores. Customers may walk into a retail store because they are curious, however, that same concept does not apply to online because of saturation.

Lastly, Amazon will be an integral part of customers routine lives with its grocery stores, fashion stores, and cross-selling. Amazon will put many more retailers out of business because of the brand loyalty that customers will develop with its products and stores. Perhaps even more crucial to its disruption will be a tiered pricing model with the same prices on its website for Prime members and everyone else paying regular retail prices (Berg, 2019). This is different from traditional loyalty rewards that traditional retail stores provide since their prices are typically on select items and Amazon's benefit will be on all items throughout the store. Furthermore, it can cross-sell its profitable in-house products such as the Amazon Kindle and Echo. If Amazon implements these retail stores, it will entice many people to either join Amazon Prime or to switch retailers to get more out of their Prime membership; therefore expediting the process of putting traditional retailers out of business.

The Retail Store of the Future

The culmination of the previous parts in this section finally leads to what the store of the future will offer consumers. The first, and perhaps the most important, thing to consider is that the retail stores that will survive will focus on WACD: What Amazon Can't Do. This means an increased focus on community, services, expertise, and experience. Not only will it be a place to buy but also a place to work, eat, play discover, learn, and grow (Berg, 2019). Good examples of companies that already do this are Starbucks, WeWork, Whole Foods, and Lifetime Fitness. Customers will have a divergence between fun and functional shopping with most of the functional shopping being done online. However, people will go to stores for discovery and experience.

Amazon is also a great place to start with what retail stores of the future will look like. It will eliminate two of the biggest pain points for customers in stores, finding new products and waiting in line to get them. Amazon Go stores already have Just-Walk-Out technology, which capitalizes on spend for omnichannel integration because Amazon knows who walk in since the consumers must use the Amazon Go App. When customers pick up an item they will have the item added to their cart and if the customer walks out the store with the item then they are charged through their preferred payment. This removes barriers to shopping such as checkout lines, scanning, and continually getting the items in and out of their cart. The technology that makes this possible include AI computer vision, sensor fusion, and deep learning technologies. Implementing this technology drastically increases the barrier to entry because of extremely high fixed costs. Nonetheless, the result is drastically lower costs from the elimination of human interaction, adding autonomy to the user, and decreasing loss from theft. While the technology is notable, the main benefit goes to the consumer who has lower prices, faster checkout, and a more frictionless experience. The on-my-terms shopper will continue to have higher expectations with having a frictionless experience with mitigation or elimination of things involving queue, delivery issues, and poor customer service.

Going back to WACD (What Amazon Can't Do) retail stores, there are some notable examples. First, Best Buy, a company who many thought would be put to extinction by Amazon has been reporting profits in 2018 and 2019. The company recognized in 2012 that many customers were 'showrooming' its products while in the store. According to Techopedia, **showrooming** can be defined as:

"Showrooming is when a shopper visits a store to check out a product but then purchases the product online... This occurs because, while many people still prefer seeing and touching the

merchandise they buy, many items are available at lower prices through online vendors. As such, local stores essentially become showrooms for online shoppers."

This is different from another popular concept known as **webrooming**, which can be defined as:

"Webrooming is the opposite behavior to 'showrooming.' With showrooming, retailers are faced with the challenge of customers coming into the store to browse and test products, only to subsequently go home and actually complete their purchase online (often through a competitor.) Webrooming, on the other hand, is when consumers research products online before going into the store for a final evaluation and purchase."

It is important to note that webrooming is on the rise, and according to a Harris poll, 69% of people webroom while 46% of shoppers showroom (Adler, 2014). There are multiple reasons for this trend. First, stores are offering more amenities for things such as free wifi as well as events. Second, better employee training to build a knowledgeable sales staff to help customers discover the right products for them. Third, smartphone discounts to nudge customers to buy in stores. Fourth, multichannel selling. Lastly, a greater focus on customer experience to provide customer satisfaction and overall pleasant experience in a store (Khan, 2018). Therefore, there will be many more retail stores such as Bonobos, ModCloth, and Clearly, which showcase products for customers to touch and feel products then shipping the products to their door (Khan, 2018). The bottom line is retail stores either need to help customers discover new products or have an amazing experience.

Section 3 - Who, Where, and How to Market AR in Retail Stores

Successful marketing of augmented reality consists of five key things: simplicity, customer-oriented, contextually relevant, the hook model, and discovery as well as experience.

First, AR should be simplistic and intuitive for consumers to use. Simplicity will be a key factor in creating augmented reality applications. Evan Williams, the co-founder of Blogger and Twitter, said that his formula to building two widely successful companies is to “take a human desire, preferably one that has been around for a really long time... Identify that desire and use modern technology to take out steps” (Eyal, 2014). Successful simplification involves removing obstacles that could stand in the way of the consumer (Eyal, 2014). According to the Fogg Behavior Model, there are six “elements of simplicity” which influence a task’s difficulty including:

- Money – how much it will cost someone
- Time – How long it will take someone to complete an action
- Brain cycles – how much mental effort is required to accomplish a task
- Non-routine – how much it disrupts a person’s existing routine
- Social deviance – How accepted the behavior is to others
- Physical effort – how much labor is involved to accomplish the task

Companies should seek to take an existing routine or problem from a user’s experience in a store and make the process as seamless as possible. Additionally, research has shown that consumers value fewer options because it involves less thinking in comparison to having too many options (Schwartz, 2014). This concept was the subject of the book, *Paradox of Choice* by Barry Schwartz, which emphasizes why more choices result in less satisfaction with the choice. Analysis paralysis is something that should be avoided when creating offerings for consumers. For example, one of the key reasons Trader Joe’s has become successful is because it offers

private label products, which significantly reduces the number of options for consumers to choose from compared to other grocery stores. Retail stores can provide a plethora of options for consumers, and AR can be the technology that makes a simpler shopping experience to increase satisfaction for consumers.

Second, marketing AR applications should be customer-oriented. This involves empathizing with the end user and understanding their wants and needs. AR should be seen as a technology that makes customers have a higher value on a company's brand. As shown in **Exhibit 4**, Design thinking is a popular and effective method for businesses to implement products or services that strategically meet consumers ideas and desires (Brown, 2008). Since AR is an emerging technology that is focused on enhancing interactions and communication between retailers and networking shoppers together, the design thinking process becomes fundamental to successful implementation into retail stores.

Co-creating value with customers is an integral part of spreadability and creating a system that becomes more powerful from network effects. For example, Nike introduced Nike+ for runners in 2006 and created the DART model - Dialogue, Access, transparency, and risk-return (Venkat, 2008). The introduction of the Nike+ app on iPod Nano's allowed runners to access valuable data and conversations between the company and other runners. Furthermore, these conversations and data were transparent and allowed runners to see their process. Runners were also introduced to a sociability aspect with seeing their personal connections and runners outside their network progress, which increased engagement, experience, and spreadability. The greater value was added because the risk-return for runners was low as a result of the information gathered helped to decrease the risk of injury. This example is not only used to show how Nike understood its users but also how it leveraged technology to create an environment that is

mutually beneficial. Augmented reality will be synonymous to shoppers in retail stores as the Nike+ app was on the iPod nano. Retail stores can utilize AR for co-creation of value with consumers by helping them along the way and design thinking is an excellent tool to successfully meet their needs and desires.

Third, AR should be marketed with context. Marketing for in-home versus in-store are extremely different and have vast differences for consumers use. It is important to design specifically for consumers in the retail environment in enhancing customers experience. Identifying the purpose of retail stores and how AR can add value to customers is essential for the effective implementation of this technology.

Fourth, AR marketing efforts should be maximized by having consumers make repeat visits into stores. In the book, *Hooked* by Nir Eyal, he discusses a cycle of four factors, shown in **Exhibit 5**, for consumers to keep coming back to a product or service. The first thing to do is trigger user's externally through things such as downloading an app and having it on the user's phone. Internal triggers should also be focused on creating a need that the consumer wants to have satisfied by understanding what the user really wants. Second, action should be accomplished by having the simplest action in anticipation of reward. The third aspect of the Hook model is variable reward, which involves having a fulfilling reward with the user wanting more. The last aspect of the Hook model is investment by users putting in a bit of work to increase the likelihood of returning. The Hook model is extremely important for AR applications going forward because one of the main reasons AR is not being more widely adopted is because it does not have reasons for consumers to keep coming back to use the applications.

The last part of the AR marketing retail formula is identifying the best way to apply retail through discovery or experience. As will be discussed in the next section, discovery and retail

are the two main things that AR will improve for retail. This lead to the creation of the AR retail model, which is the subject of the next section.

The Experiential Discovery Retail Model (EDRM)

The two key ways that AR can be implemented into retail stores is through either enhancing the experience or helping consumers discover new products, deals, or services. Before implementing AR into stores, retailers should identify the purpose of their retail stores and where they fall on the EDRM scale, which is shown in **Exhibit 6**. Every retailer falls somewhere on the EDRM scale and where a retailer identifies itself is vital to the usage of AR in retail stores. For instance, Starbucks is a retailer focused on offering extremely high customer service and building community. What keeps people coming back is the overall experience. However, for most people discovery is low. Starbucks customers frequently order the same thing. Conversely, Kroger is a retailer that serves high value in offering lots of discovery for its users with a wide range of diversity of products. Walking into a Walmart is more fueled by getting grocery items than it is as a place to relax. Therefore, consumers are much more likely to utilize AR for discovery rather than enhancing the overall experience. Organizations and marketers that place their organization on EDRM gives them a powerful step in implementing a successful AR application for their retail store. Once EDRM has been identified for a retail store, the next step is to implement discovery and/or experience with AR.

Utilizing Discovery for Increased Foot-Traffic

Retail stores that have a focus on discovery must identify objectives that AR is best used for based on areas such as increasing foot traffic, customer engagement, or conversions.

Pokémon GO is a revolutionary AR game developed by Niantic and was released on July 6, 2016, on Google Play and the app store. After its first year, Pokémon GO had over 100 million downloads, generated \$268 million in revenue, and captured over 20 million daily users (Dogtiev, 2018). Furthermore, 90% of the 34 million people who downloaded the game in the first month were still playing the game – refer to **Exhibit 7** and **Exhibit 8** - which is much higher than the average (Dogtiev, 2018). This demonstrates the potential for AR, and how it can drastically improve retention. There were numerous AR games in the app store before its release; however, this was the first augmented reality game in the market with this degree of success. In fact, this was arguably the most successful AR product or service ever released at the time of this writing. There are numerous takeaways that in-store retail stores should learn from this game.

- i. Users play it while walking around (Scoble, et al. 2017),
- ii. Users see Pokémon creatures, or ‘trophies’ on top of the real world in augmented reality to create an IKEA effect, and
- iii. Pokémon uses phone sensors to control the playing surface

First, Pokémon GO incentivized millions of people to leave their homes to search for Pokémon gyms and capture Pokémon by walking around.² These gyms are often located in public places such as restaurants, malls, and other retail stores. In Japan, over 3000 McDonald’s outlets were used as sponsored Pokémon gyms where users could take over the area after battling (Mayo, 2016). This drastically increased foot traffic in these McDonald’s and demonstrates that a sponsorship motivates people to go to local areas to accomplish their in-app goals.

Furthermore, McDonald’s generates more revenue because consumers are more likely to

²he describes the difference between sustainable and disruptive technology. He provides research for why existing companies can adapt to s

purchase meals in restaurants. Pokémon GO benefits from the sponsored revenue provided by McDonald's. Ultimately, the companies, consumers, and community are happy, but more importantly, the potential of AR to motivate consumers to visit retail locations without feeling pressured is demonstrated.

While the Pokémon GO concept is a specific example, it leads to a broader concept of introducing this idea to other retail locations. This concept is known as **pinpoint marketing**, and it is the ability for brands to make offers to people based on their location, time of day, personal profiles and buying patterns. (Scoble et al., 2017). Snapchat is currently doing this, and it enables mass micro-marketing to target customization for each person versus mass marketing campaigns, which the authors term "pinsnapping". "Pinsnapping lets big brands get local and personal so they can customize offers to millions of people attending thousands of events – a few people at a time." (Scoble et al., 2017). The increase in mobile usage is key to mass micro-marketing because apps can track a consumer's location and other preferences while on the go.

Brands can use the concepts learned from Snapchat and Pokémon GO to implement pinpoint marketing with augmented reality to increase awareness and appeal in-stores. Perhaps when walking or driving, smartphone users will receive notifications of a special deal to incentivize these individuals to shop at these retail outlets. Brands could incent consumers by retargeting items they have searched and offer discounts in-store. Another option is for brands to partner with games such as Pokémon GO to draw people into stores and create locations to gamify shopping patterns for greater foot traffic. Lastly, extended live experiences could help increase awareness by creating unique, enriching, and authentic experiences in AR that consumers must visit to see (Forbes Agency Council, 2017). These are exciting possibilities in AR that marketers can get creative with to enhance reality.

Utilizing Discovery for Increased Customer Engagement and Conversions

Customer engagement is an important way that marketers can utilize AR in retail stores.

Walmart customers, for instance, are typically more focused on getting their groceries, therefore AR should be implemented to help them find their items and discover new items to buy. This can be accomplished by implementing an AR app in which users can hold up their smartphones to see the most efficient route to buy their groceries and offer related items while on their route.

Another example of this use in a retail store like Walmart is for users to hold up their smartphones to see AR on items for new arrivals, savings, and discounts. Implementation of this technology could be extremely useful for consumers who are focused on discounts and deals on the items that they want to buy or frequently buy.

In-store conversions can also be optimized through augmented reality. Some retailers have implemented an AR device in retail stores called Magic Mirror as shown in **Exhibit 9**. This technology allows users to walk up to a digitized mirror that allows them to digitally try on clothes based on style, color, accessories, or collections. This process could drastically reduce the try-on period in stores while offering more personalized clothes for consumers to shop through. Consumers also have a better experience with retailers and offer a fun, engaging way for people to shop better.

Optimizing Discovery for In-Store Impulse Heuristics

Heuristics have been used for many years in retail stores and online services, however AR will add a new dimension to heuristics in retail stores to generate more sales. A heuristic is defined as

a method sufficient for reaching an immediate goal. As Daniel Kahneman writes in his book, *Thinking Fast and Slow*, there are many types of heuristics that people use throughout their day and online companies have utilized these psychological roots of consumers to enhance the conversion of sales (Kahneman, 2011). When viewing a product on Amazon there are various heuristics designed to psychologically nudge people to buy. AR will allow these same benefits from online and transcribe it to the retail experience for more optimization of conversions in stores.

Three examples of heuristics, which are often used by online companies, will be optimized by retail stores using AR: availability, anchoring, and reviews biases. As mentioned earlier, omnichannel retail is the next wave of retail by offering interconnected mediums that allow users the convenience of when and where they want to buy something. This increases the importance of using the availability heuristic for users to know how many items are left in stock because some consumers may be purchasing the product online and may result in urgency to purchase the item in-store.

Anchoring is another heuristic that retailers can use with AR, which involves crossing off a high price and showing a lower price instead. Psychologically, people perceive these savings as a much greater deal than if the crossed off item were never there. Retailers struggle in showing these savings because there is limited space to show two prices, however, this is where AR can be utilized to offer a new way to look at prices.

The last and perhaps the most important, heuristic that AR will allow marketers to implement into retail stores is reviews. An essential aspect of consumer spending is trusting that a product or service is valuable enough to buy. In the past, people would perceive trust through

TV commercials. Today, customer reviews have become ubiquitous to the shopping experience because trust is created by seeing other consumers experience with a product or service.

While most consumers use their phone to check prices, reviews, and other aspects of a product online, there is a resistance to doing this because it can be cumbersome to see the validity of reviews for a product. This can be a cumbersome process for consumers and AR could be a substitute for consumers to hold up their smartphone and see the reviews of products in front of them. AR could also be used to show personalized suggestions based on size, color, deals, or other factors that are important to the user.

Experience - Create Something People will Remember

As mentioned earlier, there is a shifting trend from consumer spending from material goods to experiences. Experience is described as the fourth stage of economic progression after commodities, goods, and services (Pine and Gilmore, 1998). Specifically, retail experience is all the elements that encourage or inhibit customers during their interaction with a retailer (Berman and Evans, 2007). Positive experiences have been shown to increase brand loyalty, time spent in retail stores, increased spend, returning to the store, and recommending the retailer to others (Jain and Shilpa, 2009).

AR can greatly enhance customer experiences in retail stores. AR can be an excellent tool to generate excitement and fun in retail stores by offering a new way of looking at things and expanding the number of things that people can do in-stores. However, one important note is that this excitement with AR will not last forever and it will become increasingly more difficult to

offer an experience through AR that is extremely unique. Therefore, greater importance should be put on continually finding creative new ways to use this technology.

AR glasses or contact lenses could give retail stores the opportunity to personalize the retail experience by gathering data on each person and implementing optimal variables to meet customer needs. Marketing experiences involve all sensory inputs from things such as colors, lighting, music, arrangements, scents, and layout. Instead of retail stores having a general layout, AR could personalize each customer's experience to increase sales and create a better customer experience.

Another component of in-store experiences is saving customers time and energy to accomplish their needs or desires (Berry, 2002). One way AR could aid in this is by helping customers find an employee working in a retail store through having a digital pathway to an available person or robotic AI assistant. This is especially important in large retailers such as Home Depot or Lowe's where consumers may want to speak to an employee but cannot find one who is available.

The main point of great experiences is to have customer satisfaction and creating an amazing experience inside a retail store to create repeat customers as well as word-of-mouth. Great experiences are typically coupled with elements such as amazement, engagement, enjoyable, and pleasurable (Dholakia, 1999). The main thing is to implement a shopping experience that makes people say 'wow' from the experience.

Iron Man 3, a movie released in 2013, used augmented reality as an additional marketing medium, which aligned with the high tech theme of the movie. There were pop up stands in retail stores that allowed people to take pictures with an AR Iron Man, which would only appear if

someone took a picture of them. This was not only a good feature that excited people in stores but also offered quick implementation at a low cost and taking up less space in retail stores. Iron Man 3 also used AR in retailers by having a screen where people could use basic hand gestures to control a digital Iron Man on a big screen. This drew in lots of media attention and had crowds of people who were eager to watch and try it out.

Apple used AR in some of its retail stores to promote its new headquarters. The outline of the Apple headquarters would be seen in real life but when people pulled up their smart device, they could see the green surrounding the headquarters. This helped to show their green initiative in helping the environment and is a creative way to utilize it.

There are limitless possibilities for marketers to explore for experience and this is something that is extremely subjective for each business. Objectives should be set before brainstorming possibilities with experience because this will give a good foundation for figuring out the desired result. This will provide an excellent foundation to build a successful AR application in the retail environment.



Target Connected Millennials in Big Urban Cities

A general target market for AR consumers in retail stores is to target technologically savvy millennials who have a disposable income and are influencers to others. Breaking this target market down there are three essential aspects to utilizing AR for marketing in retail stores. First, these consumers should be technologically savvy. The age groups that spend the most time with technology are millennials and iGen - also known as GenZ. This is because these

individuals have spent the most time with technology because they have grown up with technological devices that promote connectivity.

Second, an important aspect of targeting retailers is having people with money to spend. Based on the last criteria in the previous paragraph, millennials are older and currently make more money than iGen. This makes millennials the preferred target market between them since they have a higher likelihood to go shopping and spend money in retail stores. Furthermore, these individuals will most likely be located in large, urban cities because this is where the conglomeration of shopping centers typically occur and where retail stores thrive (Mason, 2019).

Lastly, retailers should focus their attention on using their marketing efforts on influencers. The idea diffusion curve separates consumers based on when they adopt a product and consumers to spread the idea today, companies should market solely to innovators and early adopters. This is because these are the people who are most likely to spread the idea to other people since they are the most likely to be willing to try these products. These consumers are typically younger, counter-culture individuals who have a large following and are open to trying new products. Therefore, marketing budgets should be spent on getting these individuals to act on their product. Furthermore, since AR is new, innovators and early adopters are much more likely to know and open to trying this technology in unique environments. These will be the individuals who spread the product to the masses and will become companies salesforce of promoters. This is why it is essential to focus on making a purple cow product from the very beginning of the product creation phase as it should be different and good enough to get these influential people to find value and share it with others.

Section 4 - Challenges and Risks of Marketing AR

There are four key things for marketers to consider when implementing AR into their organizations. Each of these areas is major topics and should be discussed extensively with top management in companies as AR continues to become popularized.

First, AR will require more data than any other previous technology (not including AI and blockchain), which will create much greater challenges to customer privacy. Data is an essential aspect of AR because this technology works by constantly scanning the environment around individuals. Moreover, I believe that AR will evolve into a system that uses AI to understand the preferences of the user of the technology. This will require much greater processing power and data to occur. From a business and marketing perspective, this data is used to optimize consumers purchases; nevertheless, some consumers may feel AR is inhibiting their privacy. This could have an impact on how much brands can use this emerging technology. An open mindset and adaptation to changes will need to be considered by brands offering AR to consumers since many legal changes are likely to occur when this technology becomes more popular. Ethics should be closely evaluated when implementing AR to make sure the new technology satisfies shareholders, customers, and the community.

These imminent issues of customer privacy with AR present another challenge of offering a way for permission marketing for consumers who want privacy. Similar to some of the changes happening with internet privacy, it is important for businesses to ask for the permission before collecting data. A law that all online companies had to have consumers online ask for permission of the website using cookies. In a retail context, this may be done by showing a notification on a smartphone to collect data or with smart glasses that will show a notification. The important part of permission marketing, especially with a data-driven technology such as AR, is to be proactive

and ahead of the curve in making ethical changes. Companies should go above and beyond in ensuring customer privacy and ethical considerations are met. This will not only get customers used to the standards the company sets but can be an excellent way of being a leading example for others in the global community.

Big data is another challenge that marketers will face. As mentioned in the previous paragraphs, augmented reality requires mass amounts of data to adapt to the environment and user needs. Marketers rely on data to measure the effectiveness of campaigns, advertisements, and other marketing tools, so this will become a big challenge. The key thing with big data is to make sense with is going on to make logical decisions and personalized settings that meet the needs of consumers daily lives.

The increase in big data correlates with a greater risk of hacking. With so much data in passwords and other important information, businesses and marketers should put extreme focus on making a system that keeps data private and handled with extreme care. Hacking is something that cannot completely be eradicated but having steps and systems in place should be essential to mitigating problems and learning from past mistakes. While hacking may not seem like a marketers job to take into consideration, I argue that every person is an organization should know about hacking protocol and take steps to prevent this problem from occurring. As mentioned earlier, hacking will only become more prevalent, so steps should be taken now to prevent this from occurring.

Lastly, marketers should have an 'unconscious incompetence' mindset, which means that accepting that we do not know what we do not know. Because AR is a new technology, there are many things that may have never been considered by people in an organization or in general. We have to accept this and know that not everything that will be implemented will work or be

helpful. The main thing to take away, however, is flexibility within organizations and having an open mindset to change.

III. IMPLEMENTATION

What is the relevance of the findings for non-academics?

These findings are relevant for non-academics because it demonstrates valuable predictions for retail, augmented reality, and marketing. Retailers will have a better understanding of what augmented reality is and how it is relevant to their businesses. Given that AR is an emerging technology that is exponentially increasing in diffusion, it is more important than ever that retailers understand AR and figure out a way to implement it effectively into their retail stores. The importance of rapid implementation and testing is of much greater importance because of O2O companies. Therefore, the sooner retailers implement AR to its marketing strategy, the more experience it will have before competitors join. These findings are also relevant for marketers and AR companies because it presents new business opportunities.

How can the answer to the question posed aid the applicable group? (marketers and retailers)

This information aids marketers and retailers because it provides a step by step process for the future of AR, understanding the utilization of AR for retailer marketing, whom to target, and the challenges that retailers can expect. First, it is essential for retailers to understand the impact that AR will have on the industry and the future of this technology. Once retailers understand the importance of AR, it is then essential for retailers and marketers to have a clear focus on consumer trends with connectivity, O2O, and experiential spending. If retailers choose to move forward with an AR marketing campaign then it is important to use the five key concepts in the AR marketing retail formula to best implement.

Retailers can use the experiential-discovery retail model to evaluate where the company falls and how discovery and experience should be implemented with AR. Retailers should experiment with how best to utilize AR to maximize the strengths of the company and create a more enriched customer experience. Marketers should have the target market in mind for getting the right people into retail stores to create more foot traffic. Lastly, my analysis provides relevant challenges that a retailer may face and how this could pose ethical and technical challenges. The culmination of this information represents a broad overview of how a retailer can configure this emerging technology and provides a starting point for effective implementation into companies.

What advice can you give companies based on your findings?

My findings give three important areas of advice for companies. First, companies should understand the risks and challenges that are associated with the emerging technology and ensuring that there are effective rules, measures, and ethical handling of information. This is essential for companies to figure out before implementing AR into their stores and should have extremely careful discussions with all relevant members of businesses. Even with careful execution, unconscious incompetence can spark additional challenges. Furthermore, these ethical challenges should also have constant checking of implementation through perhaps an ethical committee or having the values deeply ingrained in each employee.

My second piece of advice for companies is to rapidly test and integrate the technology once a proper ethical standard is placed. There has been quite a bit of failure with implementing AR; however, this should not deter companies as the failures are the most important contribution to the future success of companies. Retailers should evaluate past successes and failures and figure learn from these experiences. In particular, it is relevant to study Pokemon Go and

understand why this AR application worked. The more a company tests, learns, and implements, the better it will do in the long-term because the experience will provide valuable knowledge to get ahead of competitors.

My last piece of advice to companies is to think differently about how to market AR in retail stores. Digital implementations in retail stores open up a new medium to market, so it is important to understand what competitors are doing and thinking differently about the process. This presents a powerful opportunity to do something truly revolutionary. This ties into the second piece of advice of testing many things out. It is not the number of good ideas that are important but the number of bad ideas because all ideas are important to doing something truly revolutionary. AR is similar to the internet and smartphones because these technologies were predicted to change the world but it took some time before innovations came along that created its value.

IV. CONCLUSION

The marketing implications of utilizing Augmented reality in retail stores will increasingly become more important as the technological capabilities and consumer adoption rates continue to exponentially grow.

There were four research questions that were answered throughout the thesis. First, how, when, and who will change retail? As discussed in the second section of the literature review, Amazon's size, trust, resources, and past decisions indicate that it will begin putting a major focus on retail stores by 2020. There are many benefits of an O2O strategy for Amazon, which has disrupted the online environment and seeks to do the same offline. The outcome will be many new entrants and competitors that will change their retail storefronts to compete and survive with Amazon. Answering this research question helps to build the rest of the framework because it gives a more clear picture of the impact of AR on a large scale.

The second research question was identifying the most important aspects of marketing AR. My research indicated that there are five key things that are needed for retail stores to successfully market AR in retail stores - simplicity, customer-orientated, contextually relevant, the hook model, and focusing on experience or discovery. Each of these aspects is important for AR applications. Design thinking is an excellent way for companies to understand their customers and figuring out the most effective way that AR can successfully meet customers wants or needs.

The third research question was about the target market for AR in-stores. This paper introduces the Experiential-Discovery Retail Model as an efficient way for retail stores to understand where they stand for offering discovery or experience. Based on where retail stores fall under for EDRM determines the focus of the marketing strategies that should be implemented using AR in retail stores. Retail stores that are more discovery-oriented will want to help customers find products and places. Discovery can be

used to improve foot traffic, customer engagement, and conversions. In-store heuristics will be more versatile because of AR, especially with omnichannel retail. Retail stores that are more experience-oriented can use AR to their advantage by creating something that people will remember. Retail stores have a lot of room to experiment and trial for generating memorable experiences. The target market for most retail stores that introduce AR in its retail stores will be connected millennials in large urban cities. These individuals in the target market should be technologically savvy, have a disposable income, and who can spread AR in retail to stores to many people.

The last research question addressed the biggest challenges and risks of marketing AR in retail stores. Important things to consider are customer privacy, permission marketing, big data and hacking, and unconscious incompetence. The main thing that marketers and businesses should look out for is big data. The big data conundrum suggests that marketers use data to improve customer satisfaction by offering personalized experiences, however, this has sparked many challenges online with companies such as Facebook and Google. AR is extremely data intensive, so the issues today will be magnified when AR becomes more adopted.

Implementing this information is useful for non-academics because it demonstrates valuable predictions for retail, augmented reality, and marketing as well as providing a framework for integration into businesses. The applicable group of marketers and businesses are further aided because they have a better understanding of what they should focus their AR applications on, whom to target, and how to target them effectively.

Augmented reality is an exciting emerging technology that is about to become a big part of many industries. Retail will need to adapt to implement this technology and with creative processes as well as experimentation, it will be something that can not only change an organization but also change the world.

REFERENCES

- “Amazon vs. Walmart: Which One Will Prevail?. Knowledge@Wharton” (2017, June 27). Retrieved from <http://knowledge.wharton.upenn.edu/article/amazon-vs-walmart-one-will-prevail/>
- An, Daniel. “Find Out How You Stack Up to New Industry Benchmarks for Mobile Page Speed.” Google, Google, Feb. 2018, www.thinkwithgoogle.com/marketing-resources/data-measurement/mobile-page-speed-new-industry-benchmarks/.
- Adler, Emily. “Reverse Showrooming’: Bricks-And-Mortar Retailers Fight Back.” Business Insider, Business Insider, 13 July 2014, www.businessinsider.com/reverse-showrooming-bricks-and-mortar-retailers-fight-back-2-2014-2.
- Azuma, Ronald T. “A Survey of Augmented Reality.” UNC, Aug. 1997, www.cs.unc.edu/~azuma/ARpresence.pdf.
- Berg, Natalie, and Miya Knights. Amazon: How the World's Most Relentless Retailer Will Continue to Revolutionize Commerce. Kogan Page Ltd, 2019.
- Berman, B. and Evans, J. R. (2007) Retail Management : A Strategic Approach (10th edn), New Delhi, Prentice Hall of India.
- Berry, L.L., Carbon, L. P., Heackel, S. H. (2002) ‘Managing the total customer experience’, MIT Sloan Management Review, 43:3, 85-89.
- “Biography.” Philip Kotler, www.pkotler.org/bio.
- Brown, Tim. "Design thinking." *Harvard business review* 86.6 (2008): 84.
- Cassella, Dena. “What Is Augmented Reality (AR).” Digital Trends, Digital Trends, 15 June 2018, www.digitaltrends.com/gaming/what-is-augmented-reality-iphone-apps-games-flash-yelp-android-ar-software-and-more/.
- Chen, Pei-Yu and Dhanasobhon, Samita and Smith, Michael D., All Reviews are Not Created Equal: The Disaggregate Impact of Reviews and Reviewers at Amazon.Com (May 2008). <https://ssrn.com/abstract=918083>
- Clicklabs (2014). How retail leverages mobile. <<http://click-labs.com/Mobile-Retail-Report.pdf>>.
- Dogtiev, Artyom. “Pokémon GO Revenue and Usage Statistics (2017).” Business of Apps, 4 May 2018, www.businessofapps.com/data/Pokémon-go-statistics/.
- Dohler, Mischa. “The Future and Challenges of Communications-Toward a World Where 5G Enables Synchronized Reality and an Internet of Skills.” The Canadian Journal of Chemical Engineering, Wiley-Blackwell, 27 Mar. 2018, onlinelibrary.wiley.com/doi/full/10.1002/itl2.33.

- Driscoll, T., Farhoud, S., & Nowling, S. (2017). Enabling Mobile Augmented and Virtual Reality with 5G Networks.
- Dusto, Amy. "80% Of Consumers' Mobile Browsing Time Is on Apps." Digital Commerce 360, Digital Commerce 360 | Internet Retailer, 4 Mar. 2017, www.digitalcommerce360.com/2014/02/11/80-consumers-mobile-browsing-time-apps/.
- Felsted, Andrea, and Shelly Banjo. "Apparel Armageddon Across the Atlantic." *Bloomberg.com*, Bloomberg, 31 May 2016, www.bloomberg.com/opinion/articles/2016-05-31/women-curtailing-clothes-shopping-hit-uk-us-retailers-iov824k1.
- Fitzgerald, Melanie. "Will Digital Brands Spell The Death Of The Physical Store." *ChannelSight*, 15 Mar. 2018, www.channelsight.com/digital-brands-spell-the-death-of-the-physical-store/.
- Forbes Agency Council. "11 Creative Uses Of Augmented Reality In Marketing And Advertising." Forbes, Forbes Magazine, 13 June 2017, www.forbes.com/sites/forbesagencycouncil/2017/06/13/11-creative-uses-of-augmented-reality-in-marketing-and-advertising/#683f4dce6b12.
- Fourtané, Susan. "The Amazon Effect: Amazon Go Stores and The Future of Retail." Interesting Engineering, 3 Dec. 2018, interestingengineering.com/the-amazon-effect-amazon-go-stores-and-the-future-of-retail.
- "Generations Change How Spending Is Trending." Morgan Stanley, 26 Aug. 2016, www.morganstanley.com/ideas/millennial-boomer-spending.
- Guyen S., O. Oda, M. Podlaseck, H. Stavropoulos, S. Kolluri and G. Pingali, "Social mobile Augmented Reality for retail," *2009 IEEE International Conference on Pervasive Computing and Communications*, Galveston, TX, 2009, pp. 1-3.
- Hackl, Cathy, and Samantha G. Wolfe. *Marketing New Realities an Introduction to Virtual Reality & Augmented Reality Marketing, Branding, & Communications*. Amazon Fulfilment, 2017.
- Isberto, Michael. "2018 Update: A Timeline and History of Augmented Reality." Colocation America, Colocation American Staff, 28 Aug. 2018, www.colocationamerica.com/blog/history-of-augmented-reality.
- Jain, Rajnish, and Shilpa Bagdare. "Determinants of Customer Experience in New Format Retail Stores." *Journal of Marketing & Communication*, vol. 5, no. 2, Sept. 2009, pp. 34–44. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=bth&AN=47715321&site=eds-live&scope=site.
- Jan van Schoot, Kars Troost, Frank Bornebroek, Rob van Ballegoij, Sjoerd Lok, Peter Krabbendam, Judon Stoeldraijer, Jos Benschop, Jo Finders, Hans Meiling, Eelco van Setten, Bernhard Kneer, Peter Kuerz, Winfried Kaiser, Tilmann Heil, Sascha Migura, "The future of EUV lithography: continuing Moore's Law into the next decade," Proc. SPIE 10583, Extreme Ultraviolet (EUV) Lithography IX, 105830R (19 March 2018);

Javornik, Ana. "The Mainstreaming of Augmented Reality: A Brief History." *Harvard Business Review*, 4 Oct. 2016, hbr.org/2016/10/the-mainstreaming-of-augmented-reality-a-brief-history.

Kaku, Michio. *Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100*. Anchor Books, 2012.

Kenton, Will. "Sharing Economy." Investopedia, Investopedia, 13 Dec. 2018, www.investopedia.com/terms/s/sharing-economy.asp.

Khan, Humayun. "Consumers Are Showrooming and Webrooming Your Business, Here's What That Means and What You Can Do About It - Customer Experience." Shopify, Shopify, 7 June 2018, www.shopify.com/retail/119920451-consumers-are-showrooming-and-webrooming-your-business-heres-what-that-means-and-what-you-can-do-about-it.

Kotler, Philip, et al. *Marketing 4.0: Moving from Traditional to Digital*. Wiley, 2017.

Kumar, Kavita. "Amazon's Bezos Calls Best Buy Turnaround 'Remarkable' as Unveils New TV Partnership." *Star Tribune*, Star Tribune, 19 Apr. 2018, www.startribune.com/best-buy-and-amazon-partner-up-in-exclusive-deal-to-sell-new-tvs/480059943/.

Martin, Chuck. "AR Marketing Shifting, \$13 Billion Ad Revenue Projected." *08/29/2013*, 24 Apr. 2017, www.mediapost.com/publications/article/299593/ar-marketing-shifting-13-billion-ad-revenue-proj.html.

Mason, Tim, and Miya Knights. *Omnichannel Retail: How to Build Winning Stores in a Digital World*. Kogan Page Ltd, 2019.

Mayo, Benjamin. "Pokémon GO Launches in Japan with Sponsored Gyms at 3000 McDonald's Outlets." *9to5Mac*, 9to5Mac, 22 July 2016, 9to5mac.com/2016/07/22/Pokémon-go-launches-in-japan-with-sponsored-gyms-at-3000-mcdonalds-outlets/.

Melville, Andrew. "Amazon Go Is About Payments, Not Grocery." *Forbes*, Forbes Magazine, 20 Jan. 2017, www.forbes.com/sites/groupthink/2017/01/20/amazon-go-is-about-payments-not-grocery/#25e5949367e4.

Meriwether, Phillips. "Augmented Reality: Altering the Future of Marketing." *Content+*, 18 Apr. 2017, contentplus.paceco.com/emerging-technology/augmented-reality-future-tech/.

Newport, Cal. *Digital Minimalism: Choosing a Focused Life in a Noisy World*. Portfolio/Penguin, 2019.

NewsCred. "Why Augmented Reality Marketing Will Be Huge in 2015." *NewsCred Insights*, 3 Dec. 2014, insights.newscred.com/why-augmented-reality-marketing-will-be-huge-in-2015/.

Next PLC 2017 annual Report (2018) Available from:
https://www.nextplc.co.uk/~/_/media/Files/N/Next-PLC-V2/documents/2017/Copy%20of%20WEBSITE%20FINAL%20PDF.pdf

- Norton, Michael I., Daniel Mochon, and Dan Ariely. "The IKEA Effect: When Labor Leads to Love." *Journal of Consumer Psychology* 22, no. 3 (July 2012): 453–460.
- Papagiannis, Helen. *Augmented Human: How Technology Is Shaping the New Reality*. O'Reilly Media, 2017.
- Pardes, Arielle. "Ikea's New App Shows the Practical Promise of Augmented Reality." *Wired*, Conde Nast, 20 Sept. 2017, www.wired.com/story/ikea-place-ar-kit-augmented-reality/.
- Rayner, James. "The Viewability Challenge: Should Advertisers Care?" *Digital Marketing Magazine*, 6 Sept. 2017, digitalmarketingmagazine.co.uk/digital-marketing-advertising/the-viewability-challenge-should-advertisers-care/4566.
- Rouse, Margaret. "What Is ARKit? - Definition from WhatIs.com." *WhatIs.com*, Oct. 2017, whatis.techtarget.com/definition/ARKit.
- Rekimoto, Jun, et al. "Augment-Able Reality: Situated Communication through Physical and Digital Spaces." *An Introduction to Biometric Recognition - IEEE Journals & Magazine*, Wiley-IEEE Press, 19 Oct. 1998, ieeexplore.ieee.org/abstract/document/729531.
- Schaverien, Anna. "Five Reasons Why Amazon Is Moving Into Bricks-And-Mortar Retail." *Forbes*, *Forbes Magazine*, 29 Dec. 2018, www.forbes.com/sites/annaschaverien/2018/12/29/amazon-online-offline-store-retail/#728cfd595128.
- Scholz, Joachim, and Andrew N. Smith. "Augmented Reality: Designing Immersive Experiences That Maximize Consumer Engagement." *NeuroImage*, Academic Press, 31 Dec. 2015, www.sciencedirect.com/science/article/pii/S0007681315001421.
- Scoble, Robert, et al. *The Fourth Transformation How Augmented Reality & Artificial Intelligence Will Change Everything*. Patrick Brewster Press, 2017.
- Schwartz, Barry. "The paradox of choice: Why more is less." New York: Ecco, 2004.
- Simpson, Emma. "New John Lewis Boss Says Department Store Needs Reinventing." *BBC News*, BBC, 30 Mar. 2017, www.bbc.com/news/business-39441039.
- "Smartphone Penetration Worldwide 2014-2021." Statista, Statista, 2016, www.statista.com/statistics/203734/global-smartphone-penetration-per-capita-since-2005/.
- Soper, Spencer. "Amazon Will Consider Opening Up to 3,000 Cashierless Stores by 2021." *Bloomberg.com*, Bloomberg, 19 Sept. 2018, www.bloomberg.com/news/articles/2018-09-19/amazon-is-said-to-plan-up-to-3-000-cashierless-stores-by-2021.
- Stone, Brad. *The Upstarts: Uber, Airbnb, and the Battle for the New Silicon Valley*. Back Bay Books / Little, Brown and Company, 2018.
- "The Impact of Augmented Reality on Retail." *Retail Perceptions*, Oct. 2016, www.retailperceptions.com/2016/10/the-impact-of-augmented-reality-on-retail/.

Thomas, Lauren. "Gap, Victoria's Secret and Even Tesla: 4,300 Store Closures Already Announced This Year." CNBC, CNBC, 1 Mar. 2019, www.cnbc.com/2019/03/01/gap-victorias-secret-tesla-store-closures-hit-malls-in-the-middle.html.

Venkat Ramaswamy, (2008) "Co-creating value through customers' experiences: the Nike case", *Strategy & Leadership*, Vol. 36 Issue: 5, pp.9-14, <https://doi.org/10.1108/10878570810902068>

"Virtual Reality - IKEA." *IKEA /AU/EN*, www.ikea.com/ms/en_US/this-is-ikea/ikea-highlights/Virtual-reality/index.html.

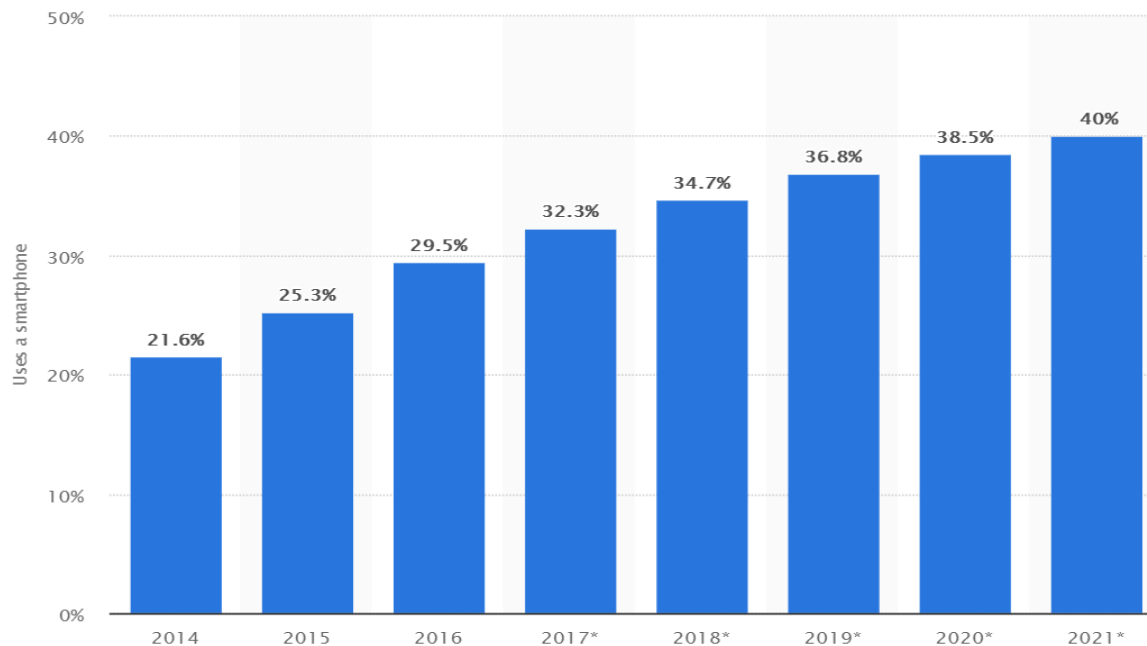
Weinswig, Deborah. "Virtual And Augmented Reality Become Realistic Revenue Generators." *Forbes*, *Forbes Magazine*, 27 Oct. 2016, www.forbes.com/sites/deborahweinswig/2016/10/26/virtual-and-augmented-reality-become-realistic-revenue-generators/#5cc04e5f6fc5.

"Worldwide Retail and Ecommerce Sales: EMarketer's Updated Forecast and New Mcommerce Estimates for 2016-2021." *EMarketer*, *EMarketer*, 29 Jan. 2018, www.emarketer.com/Report/Worldwide-Retail-Ecommerce-Sales-eMarketers-Updated-Forecast-New-Mcommerce-Estimates-20162021/2002182.

Wylie, Melissa. "No Relief for Retail in 2018." *Bizjournals.com*, *The Business Journals*, 2 Jan. 2018, www.bizjournals.com/bizwomen/news/latest-news/2018/01/no-relief-for-retail-in-2018.html.

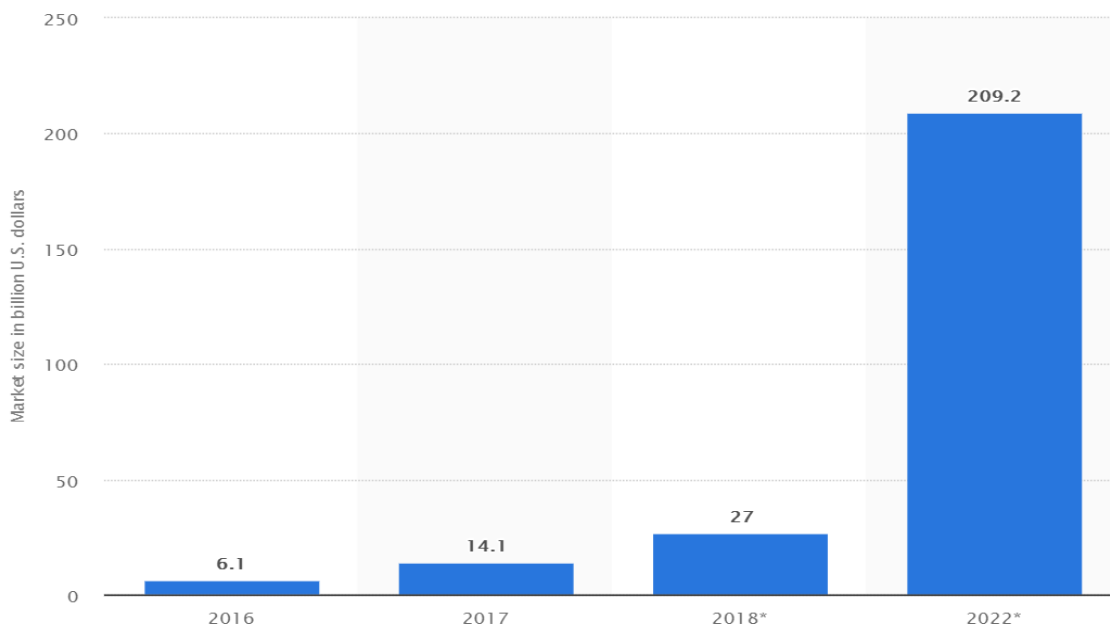
APPENDIX

Exhibit 1: Smartphone user penetration as a percentage of the total global population from 2014 to 2021



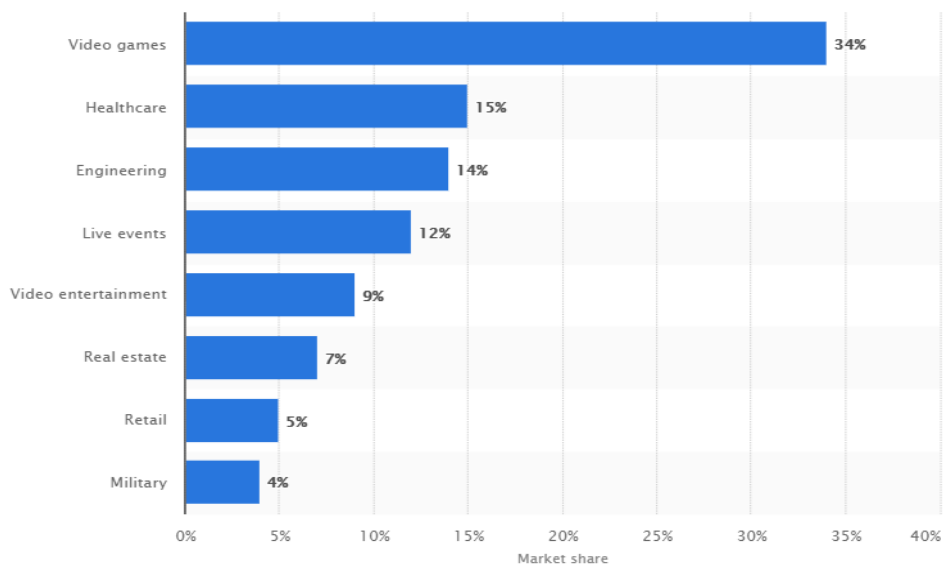
Source: https://www.researchgate.net/figure/Smartphone-user-penetration-as-percentage-of-total-global-population-from-2014-to-2021_fig2_326021242

Exhibit 2: Forecast AR and VR market size worldwide from 2016 to 2022 (in billion U.S. dollars)



Source: <https://www.statista.com/statistics/591181/global-augmented-virtual-reality-market-size/>

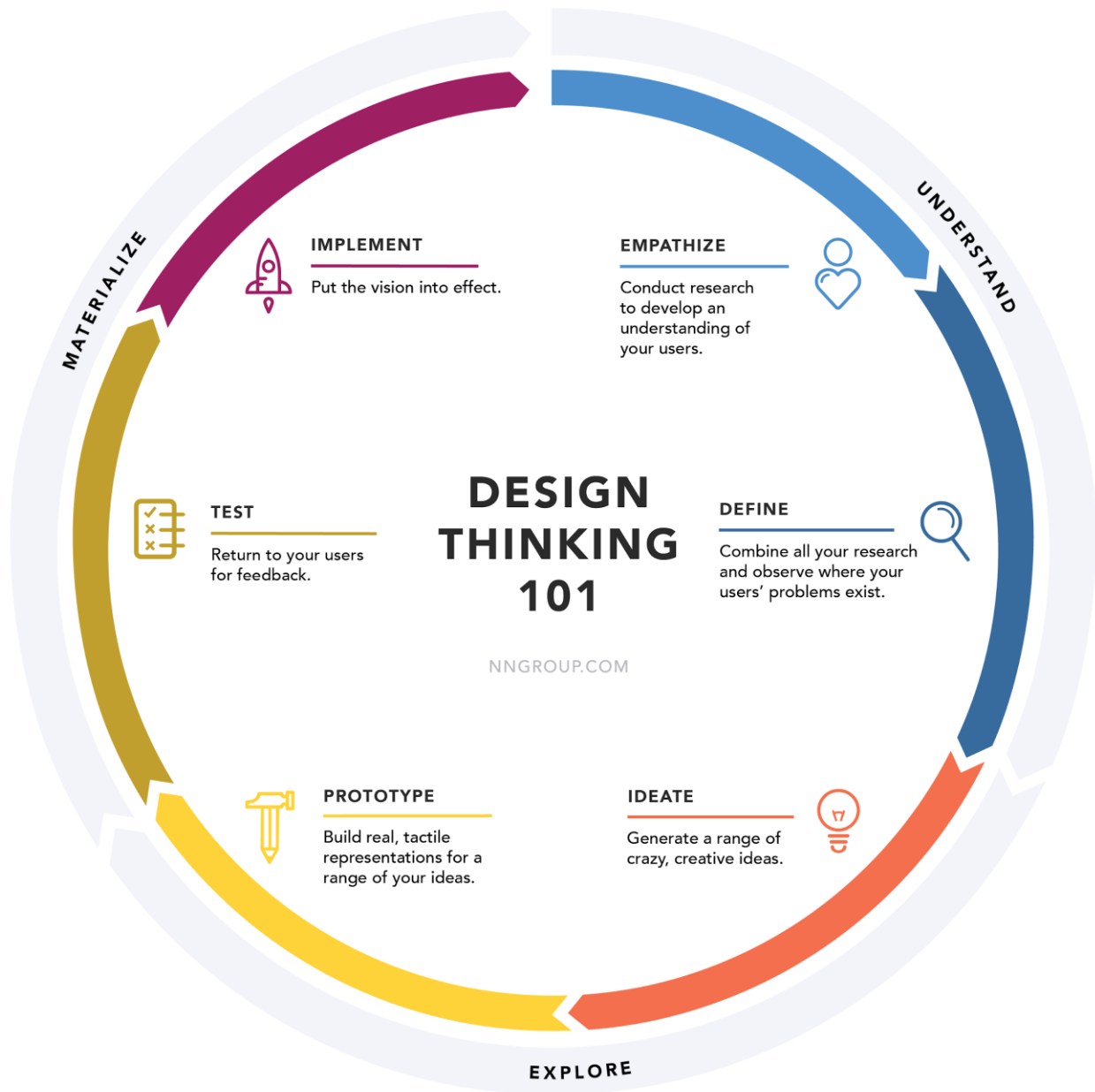
Exhibit 3: Forecast distribution of the augmented and mixed reality market worldwide in 2022



Source: <https://www.statista.com/statistics/610066/worldwide-forecast-augmented-and-mixed-reality-software-assumptions/>

Exhibit 4 - The Design Thinking Framework

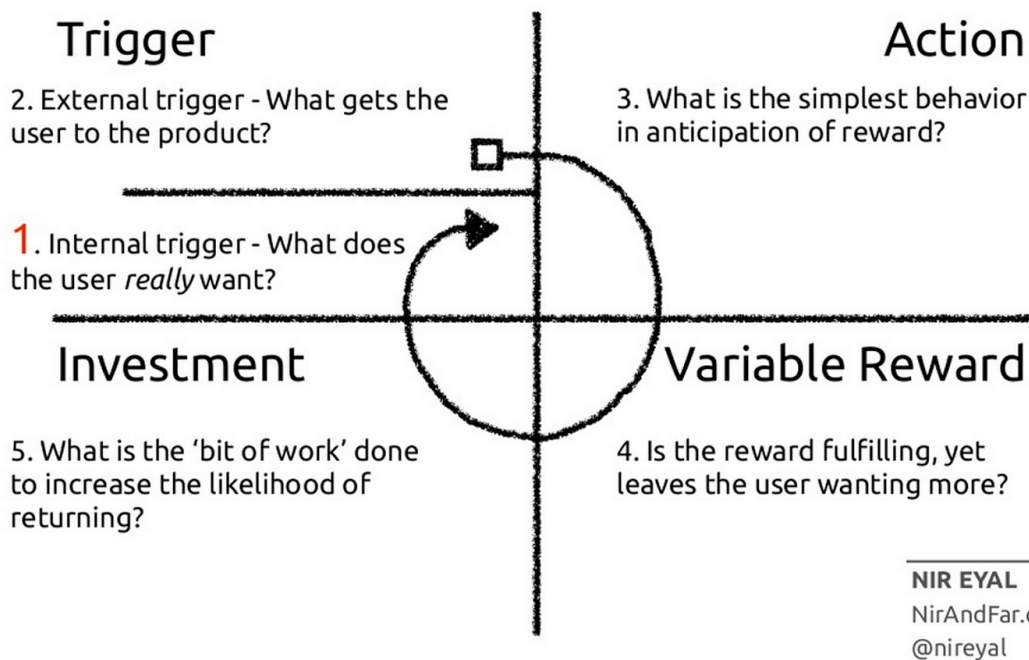
An excellent way to understand customers and implement AR to solve their wants and needs effectively.



Source: <https://www.nngroup.com/articles/design-thinking/>

Exhibit 5: The Hook Model

The hook canvas

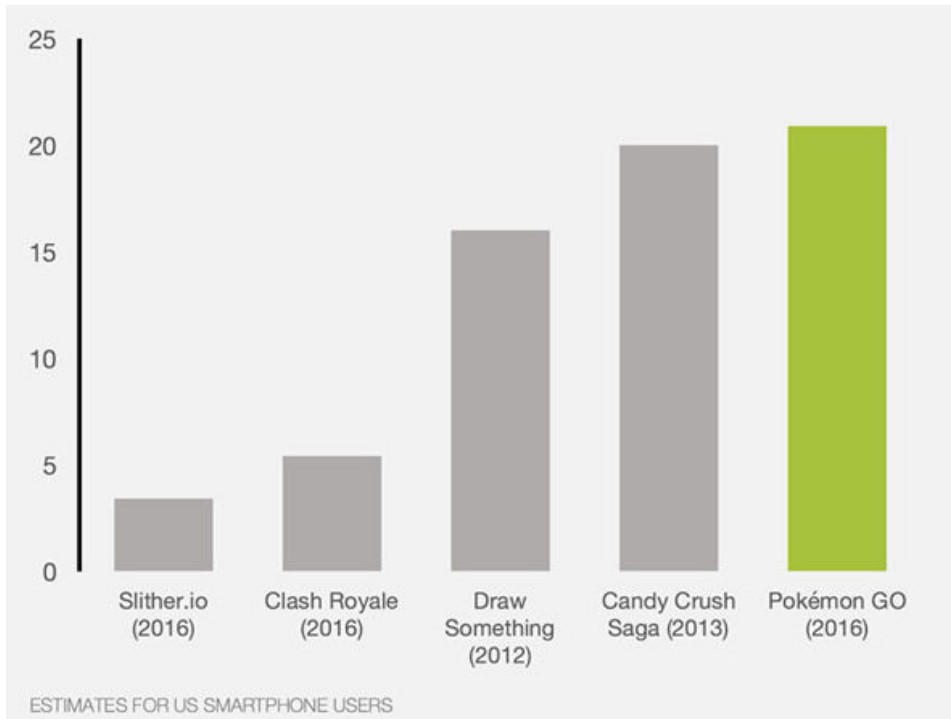


Source: <https://medium.com/i-want-to-be-a-product-manager-when-i-grow-up/the-hooked-model-fa667c33951d>

Exhibit 6: Experiential Discovery Retail Model



Exhibit 7: Pokémon GO Daily Active Users compared to previous app hits, in millions



Source: SurveyMonkey

Exhibit 8: Pokémon GO 3-day retention

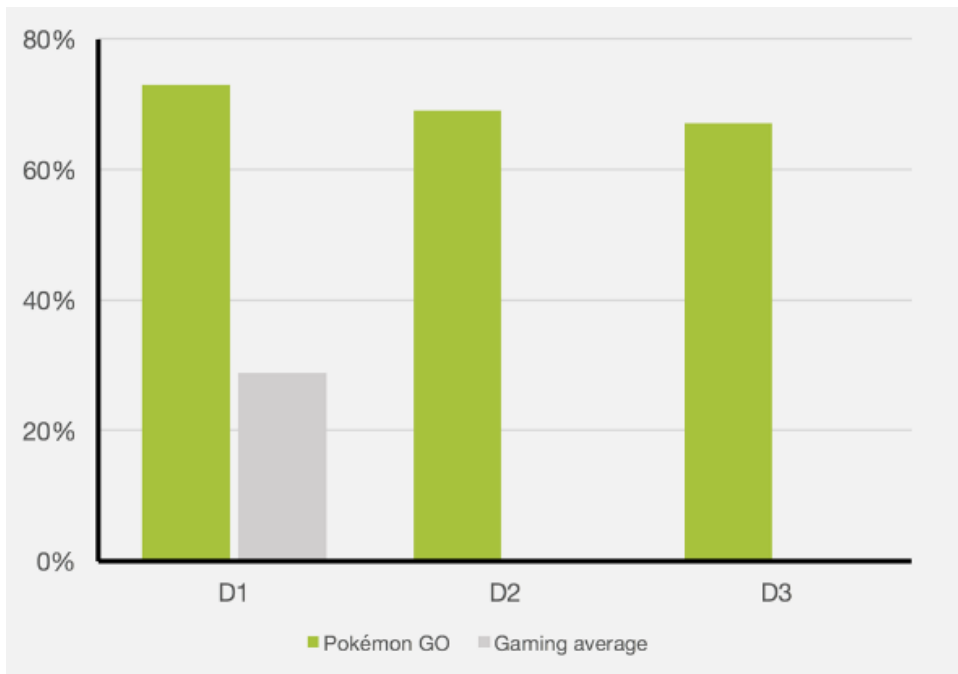


Exhibit 9: Magic Mirror

Source: <https://www.shopify.com/retail/how-these-retailers-are-using-augmented-reality-to-enhance-the-customer-experience>