

# **Impact of Technology on Retail Industry**

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## 2. Introduction of Retail Industry Market

### 2.1 What is Retail and Fundamentals of Retailing.

Today, retailing is at a bewildering crossing point. From one perspective, retail bargains are at their most raised point ever (despite a dive during the 2008-2010 "Fantastic Downturn"). Walmart is the fundamental association in the world to the extent that arrangements, but Amazon.com, fantastically a web-based retailer with few genuine stores as of this creating has a yearly advancement speed of twenty five percent appeared differently in relation to one percent for Walmart. New advancements are further growing retail convenience. There are various opportunities to start one more retail business-or work for an ongoing one-and to transform into a franchisee. Overall retailing possibilities multiply, especially for pure electronic retailers that can rehash their game plans all around without the capital costs of store-based retailing.

On the other hand, retailers face different challenges. The rising of the U.S. dollar against critical money related principles recently fundamentally influences retailers, their suppliers, and buyers across the globe. Various clients are depleted from searching for things or on the other hand don't have a great deal of energy for them and are spending something else for encounters. A couple of districts have an unreasonable number of stores, and retailers consistently nudge each other into unremitting worth cutting (and low incomes). Client care presumptions are high when more retailers offer self-organization, motorized structures, and omnichannel mentioning and get organizations. Though online E-exchange addresses just 7.1 percent of U.S. retail bargains, today it is creating at a speedier rate and evacuating bargains livelihoods at stores. A couple of retailers are at this point grappling with their omnichannel procedure to the extent that capital and human resource adventures for in-store versus progressed courses of action, putting together advancing, assessing, and collaborations across channels. What's more, the relative complement to put on picture redesign, client information and information, and arrangements trades.

The broad improvement of adaptable and electronic media progressions has been difficult for certain retailers to change in accordance with their strategies from one side of the planet to the 3 others. New age electronic developments like versatile media, web-based entertainment, and Web 2.0 have changed how the purchasers and organizations choose, get information, pass on, execute, what's more, own versus share resources all over the planet. In this powerful and cutthroat retail scene, purchasers pick how, when, and where they need to work together with retailers. Retailers are depended upon to be proactive and adaptable in anticipating their purchasers' necessities by then and utilize an omnichannel method for managing outfit the client with a predictable shopping experience, whether the client is shopping on the web from a workspace or a wireless, by telephone, or in a squares and mortar store.

## 2.2 Growth of Global Retail Industry environment

The globalization of retail enterprises has been predominant for a long time from this point, with Retailers get together and gather merchandise from across the globe to fulfil their purchaser needs. Nevertheless, amidst the 1990s, capital retail advertisements made tremendous suppositions for crossline market development by driving retailers that had concentrated their business areas at home. The focal point of Investors moved more towards consolidations and acquisitions. Centre was additionally more towards broad development abroad. This situation left the unpractised administrators experiencing the same thing because of their absence of capacity to settle on essential choices. As they attempted to do as such, the business areas arrived at conclusions unexpected. Along these lines, Tesco, notwithstanding the way that it later turned out to be talented and bold overall retailer, had its advancement prospects put aside for different years considering one insufficient undertaking to wander into France.

Notwithstanding financial backers' fundamental suppositions, the value that had been attributed to abroad augmentation exhibited is very challenging to approve. One significant explanation being the questionable nature of scale economies in crossline retailing. Notwithstanding the apparent reasoning that more noteworthy volumes of merchandise ought to be doled out lower unit costs from creators, the respectably low worth of consistently utilized items and the critical costs to transport the product suggested that such aggregation existed more in hypothetical ideas than progressive circumstances. There is no value to getting in transportation something that can be even more economically made locally. It is like manner turned out that utilization propensities and tastes are exceptionally impervious to change particularly those connected with food. This presented to be really difficult for the food merchants, who include a significant piece of the retail commercial centre and they are additionally the ones on whom the best standards were set for crossline development.

On the other hand, the retailers that convey business on the most recent product offerings particularly inside the purchaser hardware industries were effective in instructing different ages of clients 4 universally. What goes along with us across the world in using a mobile phone or tablet PC isn't something we share in setting up our evening suppers. Following these overwhelming illustrations, the broad expectations on crossline development of the retailers have diminished to a more noteworthy degree. Circumspectly, and with two or three stages backward despite the ones taken forward, a great deal of driving retailers has continued to develop their worldwide associations from that point forward. Without a doubt, while many had acknowledged that globalization required gigantic extension and the replication of courses of action, experience has instructed them that What was hugely significant is neighbourhood market arrangement and scaling and furthermore organizes that are more firmly adjusted towards homegrown purchaser needs.

## 2.3 The mercantile, modern & digital era of Retail

### 1. The Mercantile Era

The journeying merchant of the late Middle Ages was the principal unmistakable retailer in the sense we appreciate the term. For a seriously prolonged stretch of time, his ancestors in business had taken things they had made to business areas and fairs, by walk, horse, or bull, and sold them directly to local people. On the other hand, the retailer who emerged in Europe in the 13th century was a representative, buying stock from producers and offering them starting with one town then onto the next and town to town. For by far most, in any case, various while possibly not every one of their material requirements were given through autonomy. In a metropolitan, postmodern culture, we expeditiously neglect to recollect a vast expanse of smallholdings and assets, in which easy-going arrangement was as critical a technique for exchange as money trades.

### 2. The Modern era

The start of the Industrial Revolution during the eighteenth century indicated the beginning of a long influx of progress and innovative turn of events, from the message to the PC. It saw the progression of retailing from Abraham Dent's ordinary corner store to the hypermarket chain contorted on abroad augmentation and the vertical retailing model of the Spanish clothing brand Zara as globalization shrank the world toward the finish of the 20th hundred years. Each improvement in the middle of the department stores, the buy request inventories, self-serve supermarkets, the edge-of-town classification executioner tended to an improvement in cementing the power of the retailer as authority among supplier and buyer. The retailer alone could match market revenue for a tremendous scope and thus sell at low expense, beneficially.

### 3. The digital era

Albeit the unfamiliar commercial centre continued to captivate many, retailers coordinated them fixation toward the electronic, mechanical progressions and exceptionally soon numerous acknowledged the computerized transformation would exhibit as earth shattering for retailing as its modern ancestor had been. The term new economy quickly immersed the astuteness What's more, made a hypothesis impact in another initiating sort of retailing, which is the current web-based business (online business). Without a doubt, even the littlest of computerized recommendations at first had prompted extraordinary effect and fervour in the personalities of the business visionaries and financial backers where both the gatherings expect the appearance of something incredible critical.

### 3. Effects of Technologies on Retail Industry and Its Future

#### 3.1 How Technology is Changing Retail

Ongoing advances in innovation have reshaped and keep on reshaping numerous enterprises. Retailing is no special case. In ongoing times, innovative advances have sped up sensational moves and caused critical interruptions in the retail scene. For instance, with innovation driven advancements going from a single tick requesting to customized suggestion to brilliant speakers to expectant transportation, Amazon has reclassified shopping and dislodged numerous physical retailers

A considerable number of these advancements are controlled by computerized reasoning (AI), which is reshaping retailing incredibly. "Computer based intelligence alludes to programs, calculations, frameworks, or machines that illustrate knowledge. More for the most part, it is utilized to indicate a set of tools that can improve the intellectual prowess of an item, administration, or arrangement". Utilization of AI in retailing incorporate personalization and suggestion frameworks, deals/client relationship with the executives, client assistance the board, production network streamlining, stock administration, and store task creation. The advancements in retailing have taken a sensational jump following the flare-up of the COVID-19 pandemic. As an aftereffect of the safe house set up and lockdowns pointed toward containing the spread of Covid, numerous physical retailers have been compelled to shut down physical stores and move more quickly toward innovation-based arrangements like internet requesting and satisfaction, snap and gather, and robot-helped activities.

The sensational week-to-week or everyday changes in shopping patterns during the pandemic's flare-up imply that those with moment admittance to information would be better educated and improve speculations than those utilizing less current information. Versatile worldwide situating systems (GPS) utilized for store traffic refreshments is the only way innovation is assisting brands and retailers with keeping up with wild shifts in customer conduct during this unprecedented flare-up. Given the speed at which innovation is evolving retailing, specialists and professionals in retailing look for methodical comprehension of the nature and degree of these effects. While much exploration has inspected how advancements, for example, point of-deal, computerized teller machine (ATM), and the Internet have changed retailing, not much is had some significant awareness of the effects of arising advancements, for example, miniature distributed computing, new mechanical technology, fifth era (5G) media transmission, the Internet of Things (IoT), computer generated reality (VR), increased reality (AR), and blended reality (MR) on retailing.

Cloud computing, the act of utilizing an organization of remote servers to store, process, and oversee information, has been generally embraced by the two retailers and supply chain members. Cloud registering is flooding in prevalence since it is becoming less expensive, more versatile, and safer than previously, permitting retailers, everything being equal, to utilize it. Miniature distributed computing is extraordinary, distributed computing innovation that permits

clients to be nearer to their clients and other existing foundations at a more limited size without compromising execution and without being attached to an enormous public cloud. A miniature cloud found topographically at the store/area of retail will uphold asset concentrated and intelligent versatile applications by giving the registering and information assets to cell phones with lower inactivity, while not overburdening the undertaking. These micro-mists will likewise help deal with the consistently expanding "information sea" made inside a retail store/climate. For instance, stores and purchaser producers can offer customized computerized coupons on items that move gradually at a particular area utilizing the information on neighbourhood miniature cloud with zero inactivity (slack). Such training can prompt expanded deals and purchaser unwaveringness

5G indicates the fifth era of remote media transmission innovation that upholds cell information, voice, and video networks. It includes superfast transmission of signs, empowering numerous momentary, stable, and continuous intelligent computerized and in-store shopping applications, including those including other advancements like IoT, VR, AR, and MR with AI at the edge. 5G can assist retailers with a few use cases. 5G can decrease the power utilization of in-store IoT gadgets, permitting retailers to access innovation like brilliant marks and other retail upgrading sensors. It opens a few use cases in the space of customized signage considering closeness of the client to the actual sign. It additionally has long-haul potential for more affordable and more ideal approaches to following items inside the production network. The IoT is "an arrangement of extraordinarily recognizable and associated constituents equipped for virtual portrayal and virtual availability, driving to an Internet-like construction for remote finding, detecting, and additionally working the constituents with continuous information/data streams between them". VR is an innovation that offers a vivid encounter where everything seen is counterfeit. VR reproduces the climate, closing out this present reality through a wearable gadget (ordinarily a headset) to give a vivid 3D climate (e.g., virtual video games). AR makes an extra and intelligent experience of a certifiable climate through PC produced shows, making intelligent, distinctive, and rich encounters.

Administrative changes are a critical force to be reckoned with in retailers' reception of advancements. Administrative changes frequently command retailers to take on another innovation. Given the circumstances, banking guidelines have cultivated changes in retail banks taking on advancements going from ATMs to versatile compensation. Some of the time, accomplices or biological system prerequisites lead to retailer reception. For instance, Following prerequisites from significant charge card organizations, such As Visa and Mastercard, numerous retailers introduced chip-readers in their stores. Contactless charge cards utilizing NFC advancements are the up-and-coming age of charge cards. It doesn't need clients to swipe, plunge, or supplement their charge cards, keeping away from any actual contact with retailer foundation. In the COVID-19 and past situation, it will build up some decent forward momentum and power retailers to take on such contactless charge card readers.

## 3.2 Retailing in Metaverse

What is Metaverse? What we know so far is: It's a virtual, vivid world. It resembles the experience you have on the web, however more so. Not at all like our PC screen, it's three-layered and more engrossing and sensorial. You'll have the option to communicate with individuals more as you do face to face. For now, brands are testing metaverse. They are utilizing the early metaverse to foster mindfulness, commitment, unwaveringness and to learn. Extravagance brands like Burberry, Dolce and Gabbana, Hermes and Gucci are utilizing NFTs to produce interest.

The potential for retail in the metaverse, when the innovation is better, is to make web-based shopping seriously captivating and valuable. An instrument that would permit purchasers to investigate and find better compared to them can now carry web-based shopping nearer to what customers can achieve in stores, while never venturing out from home. On the off chance that that could occur, then, at that point, the method involved with changing over guests into clients, which today is significantly less successful online than coming up, could make online retail an undeniably more reasonable, and important, business. It would likewise gigantically affect the reasonability of numerous actual stores.

About Metaverse in retail, there are those that anticipate the production of shopping settings - stores, shopping centres and that's only the beginning - in the Metaverse. This is most likely foolhardy. To just vehicle modern age shopping ideas and shows to the Metaverse would be both unoriginal and insufficient. The production of the Metaverse will permit us to break liberated from the ongoing modern structure and capacity of actual stores and move light an exceptionally long time past even the best computerized shopping encounters of today.

How could one make a virtual reproduction of a Canada Goose store when in the Metaverse I might search for another Canada Goose coat from inside an Arctic investigation experience drove by Iditarod champion and Canada Goose representative Lance Mackey? There I can acquire direct, context-oriented information on the article of clothing's specialized quality and execution, request it and have it conveyed to my certifiable home. I can purchase my new vehicle in the Metaverse - not from a static display area of vehicles but while taking an adrenaline-siphoning test drive on the circuit fitting my personal preference. I can get magnificent exhortation from an individual consultant that I pull from the Metaverse into my family room. As we know it where any experience is conceivable, why for heaven's sake could we involve our modern period adaptation of retail as a layout for what's to come? Advertisers, store originators, merchandisers and more should start contemplating what a "store" is.

On schedule, we all will invest energy mingling, getting the hang of, working, and engaging ourselves in the Metaverse. Some might decide to invest the entirety of their waking energy there, seeing this present reality as dull, restricted, and wasteful by examination. With expanding measures of time spent in the Metaverse, the proportion between the virtual and actual belongings we own will increase emphatically. At the end of the day, who needs to wear a similar virtual outfit to two distinct virtual gatherings in a similar virtual end of the week?



As we invest more energy in the Metaverse, superficial points of interest like the virtual home you own, the virtual apparel and adornments you wear or the virtual beauty care products you use will turn into just as significant as those equivalent certifiable buys and assets are today. Brands will benefit from this interest by making a consistently developing arrangement of virtual items at certifiable costs. Without a doubt, the sheer measure of time that one can spend in the Metaverse, rather than this present reality, may be seen as a superficial point of interest.

Nobody knows for certain, however what most specialists concur upon is that the Metaverse, while years or even an exceptionally long time off, is an unavoidable advance in the intermingling of humankind and innovation and a transformative merging of the real world and virtuality. And keeping in mind that the Metaverse might take a long time to create, there will be progressively sizeable speculations made now and, in the days to come, by associations constructing that future.

Scuti, for instance, is a beginning up that focused on "rejuvenating the world's initial retail commercial centre through games and permitting brands to sell and transport direct to game players." Obsess, is another beginning up building CGI conditions and encounters for significant design and magnificence brands. Organizations like Ikea are as of now effectively utilizing increased reality innovation to permit clients to plan their spaces utilizing its studio application. Magnificence monster L'Oréal has constructed a whole line of virtual beauty care products. What's more, Gucci has started selling virtual apparel, sending off its Gucci Virtual 25 tennis shoes, planned by Gucci imaginative chief Alessandro Michele, for \$12.99 per pair.

Every one of these things, while restricted by the advancements and conventions we use today, is a little advance toward the Metaverse. Development will come gradually and steadily until, similarly as with the web, enough foundation, designers, and clients make a tipping point.

Brilliant brands will without a doubt purchase genuinely virtual bequest and recruit manufacturers to foster their image presence and encounters, where they will offer both computerized and actual items to customers who split their time between universes. Slow poke brands and associations will be trapped and, surprisingly, more regrettable, in the ghetto that the inheritance web will turn into.

## **Utilization of Metaverse in the Retail Sector**

The adaptability of configuration stores and encounters custom fitted for ideal interest groups of brands in the metaverse is a tremendous feature for the retail area. If you have any desire to know the response to "How does metaverse change retail?" then, at that point, you should think about the top instances of the utilization of metaverse in the retail area. Here is an outline of a portion of the top players in the utilizations of metaverse for the retail area.

### **Ralph Lauren**

One of the preeminent trailblazers of metaverse clothing, Ralph Lauren, clears the establishment for utilizing the metaverse in retail. Clients could peruse and give sexually impartial computerized clothing a short Roblox gaming stage. The restricted release things estimated at 150 to 200 Robux coins can help clients in modifying their symbol.

Moreover, guests to the virtual Polo Shops of Ralph Lauren on Roblox can likewise appreciate numerous different encounters with the world. For instance, guests can broil marshmallows, participate in ice skating, or drink hot cocoa. Moreover, gamers on Roblox could likewise open various embellishments through an expedition.

## **Zara**

Another considerable model exhibiting the utilization instances of metaverse in retail area is Zara. The well-known design retailer has sent off its own metaverse, Zepeto, for sending off its extraordinary gathering of virtual articles of clothing. You can consider Zepeto a South Korean metaverse for cell phones. It has three-layered symbols and more than 2 million days to day clients, making it one of the quickly developing virtual spaces recently. Zara has genuinely gone on in presenting metaverse clothing by empowering offices for buying computerized things with the local money. Strangely, the Zepeto metaverse offers availability to many clients around the world.

One of the striking features about Zara's metaverse is that a significant portion of its crowd remembers young ladies for the age section of 13 to 24 years. The clients make computerized symbols on Zepeto as indicated by the genuine actual attributes of clients. Moreover, Zara additionally presents a strong instance of utilizing metaverse for retail by sending off apparel assortments sold in chosen stores. Furthermore, the items in the virtual climate are accessible at similar costs as in the stores.

## **Balenciaga**

The following enormous name making titles for utilizes instances of metaverse in retail area is Balenciaga. The celebrated brand went into a coordinated effort with Fortnite and has made its own committed metaverse group. Balenciaga would concentrate the endeavours of its metaverse group on distinguishing advertising and business potential open doors in the metaverse space.

## **H&M**

You would likewise observe H&M as one of the top players investigating new roads related to the metaverse clothing market. As a matter of first importance, the H&M brand is a customary member in the Animal Crossing game. The brand has reproduced eleven pieces from its Co-Exist Story gathering and displayed them in an in-game design show.

The Loop Island of H&M on Animal Crossing has been custom fitted for mirroring the veggie lover upsides of the Co-Exist Story gathering. For instance, the island boycotts hunting and fishing while the island's eatery serves just veggie lover food. Creature Crossing players could likewise download the garments at the Able Sisters shop of the brand in the game.

Aside from these top names, numerous other enormous names in design, like Adidas, Nike, Dolce and Gabbana, and Gucci, have observed the metaverse. Presently, a significant inquiry is about how the metaverse can change the retail area.

## 4. Technology Influence on American Retail industry - Walmart

### 4.1 History of Walmart

On July 2<sup>nd</sup>, 1962, Sam Walton opened the first Walmart store in Rogers, Arkansas. Within 5 years the company expanded to 18 stores in Arkansas and reached \$9 million in sales. Walmart started utilizing technology at an incredibly early stage for example in 1969 after Sam attended one of the IBM training sessions, he decided to install IBM Systems at Walmart stores to receive a daily sales report from each store to make sure the items are available for the customers. Also in 1975, Walmart leased an IBM System/370 model which was used to track SKUs (Stock Keeping Units) in addition to this they also got in electronic cash registers in every store to record point-of-sale data which would help Walmart maintain their inventory.



*"The real key is, let's truly spoil our customers as never before and beyond with our friendliness, courtesy and our obvious personal concern for their needs, appreciating them every day as we would guests in our homes. Our customer is our friend and guest who has chosen us over all other stores available on the street. Let's treat them accordingly and personally thank them for letting us serve them better with their needs."*

**Sam Walton**

### **WAL-MART'S GUARANTEE TO YOU**

*We want you to be satisfied.  
If you are not satisfied with something  
you bought, please return it and we will  
fix it, exchange it, make an adjustment  
or cheerfully give your money back. We  
want you to be satisfied.*

**WAL MART STORES INC.**

This quote by Sam Walton shows us how important customer service was for him. We can also see that Walmart had already started the return policy which shows the same. His primary focus has always been to provide customers with low prices to get a higher volume of sales. His idea was revolutionary, and he was relentless in pursuing his ambitions.

Sam rapidly started expanding nationally, by 1975 he had opened 125 stores nationally and had a total sale of \$340.3 million. This growth continued in the 80s by the company's 25<sup>th</sup> anniversary in 1987 there were 1,198 stores with \$15.9 billion in sales and had around 200,000 employees.

In 1980 Walmart had completed its \$24 million company satellite network which linked all stores with two-way voice and data transmission and one-way video communication with the head office. At the time this was the largest private satellite network. This helped the corporate office track inventory and instantly communicate with the stores.

By 1990 Walmart had become the largest US retailer by revenue. By the mid-1990s, they started expanding internationally into Canada, Argentina, and Brazil. They entered the European market in 1999 by buying Asda for US\$ 10 billion.

By 2005 it was estimated that about 20 percent of retail grocery and consumable business was controlled by Walmart. During this period when Hurricane Katrina hit the Gulf Coast Walmart with its great logistics network helped organize a rapid response to the disaster. In total, they donated around \$20 billion, had 1,500 truckloads of food and merchandise.

In recent developments, Walmart has acquired Vudu, a video streaming service for \$100 million, and also acquired the Israeli start-up Zeekit which uses Artificial Intelligence to allow customers to try on new clothes virtually.

## 4.2 Walmart + Technology over the years

Walmart right from 1960's has been adopting modern technologies which has helped them be a global leader of IT (Information Technology) innovation. All of this began in 1968 when Sam attended an IBM computer class for executives to learn how to use computers to operate business. Soon after that in 1969 the company bought its first computer to track sales and inventories. This helped Sam figure out what items were selling and what is not, which of the items needs to be stocked up.

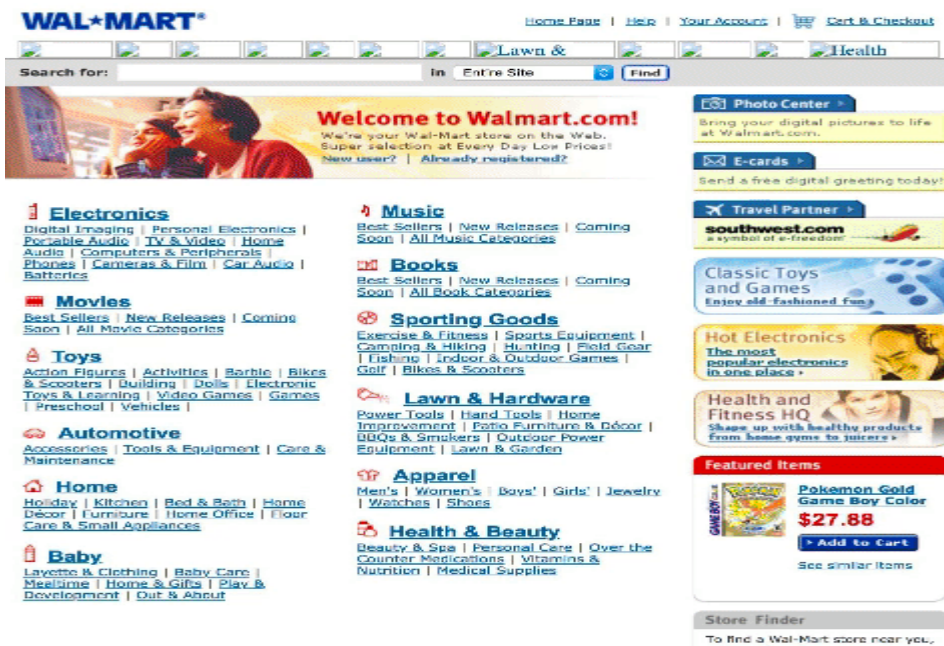
In 1975 he leased more IBM 370's to maintain inventory control for all merchandise and distribution centres and to prepare income statements for each store. In addition to this Sam also bought in electronic cash registers in more than 100 Walmart stores.

In 1983 the company adopted the use of bar codes for scanning POS data, which highly increased checkout times. Soon store associates also started using the Texlon handheld terminals, these were used to scan the shelf labels to get more information of the merchandise.

1987 was when Walmart took itself to a whole new level by building at the time the largest ever private satellite communication system in the United States. It helped the head office communicate with the stores and provide a one-way video communication to all the stores.

We can see that Walmart was well ahead of the curve by setting up a data warehouse prototype to store historical sales data. In 1992 Walmart deployed its own reporting software Retail Link, which

allowed Walmart suppliers access to POS data, documentation, reports, and store information. With the boom of internet coming in, Walmart cashed in on it by making Retail Link and EDI available on the Internet and simultaneously launched the online stores for Walmart and Sam's club.



In 2006 the new CIO bought in a huge redesign to the Walmart.com, as he starts experimenting with Web 2.0 and other social networking tools and gave contracts to use Oracle and HP to use their price-optimization and BI retail applications.

### 4.3 Current Innovations and new era of retail

Walmart is always trying something new and this time they targeted the way customers checkout, they have produced an all-new Checkout Experience which helps the customer save a lot more time.

The way the design works is, they have removed all the lanes and instead made wide open area with 30+ registers. Each register is now equipped with a green light which shows the customer that it is active.





So now when a customer walks in they are greeted by a human who is called the 'Host' (previously the cashier) and the Host helps customer all the way through the whole process. They have just launched it in one store as of now, at a supercentre in Fayetteville, Arkansas.

Also, in a ground-breaking use of augmented reality, Walmart has developed an app which speeds up the time it takes for a product to move from the backroom to the sales floor. Associates now just must hold a phone and the app uses AR to highlight which boxes are ready to go, previously associates had to scan each individual box separately. This increased Inventory speeds.

As we saw during the pandemic, everyone relied on online retailers for even the necessities. And



Walmart realized that there is always going to be a case where the item the user wants is no more available, so Walmart has developed an AI based solution which recommends the best substitutes for the given product. Walmart says that their deep-learning AI considers more than 100 variables in real time to determine the best next available item. It would then ask the customer to approve the substitute. Each

transaction will help in future predictions. As customers start using this system increasingly the algorithm is only going to improve.

To get customers what they want in a fast and reliable manner, Walmart decided to partner with Drone Up who is the Nationwide leader for On-Demand drone delivery provider is. During COVID they did a test run where COVID-19 self-collection kits were delivered via drones. The trails showed that they could offer deliveries in minutes instead of hours. This has pushed Walmart to continue working with Drone Up to produce a large-scale solution for drone deliveries.

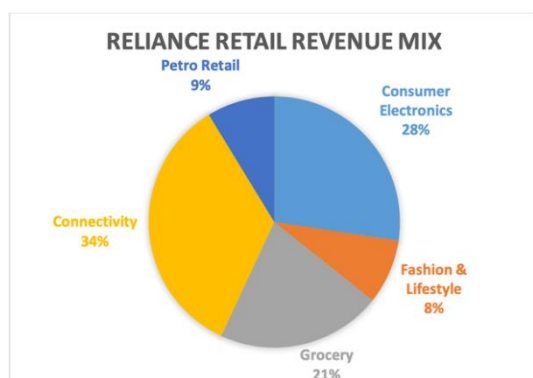
## 5. Influence of Technology on The Indian Retail Industry – Reliance Industries Limited.

### 5.1 History and Company Culture of Reliance

#### The Journey of Reliance Group: From a Small Yarn Business to a Diverse Global Conglomerate

Reliance was setup as a partnership firm in Maharashtra in 1960 founded in partnership by Dhirubhai Ambani and Champaklal Damani – and primarily dealt in retail and export of polyester and spices.

The company was then then – after an aggressive set of legal battles – divided into **Reliance Industries Limited (RIL)** headed by Mukesh Ambani – which took control over the – Oil and Gas, Petrochemicals, Refining and Manufacturing businesses and **Reliance Anil Dhirubhai Ambani Group (RADAG)** headed by Anil Ambani took over – Electricity, telecom, and financial services – which owed to his strengths and areas of expertise.



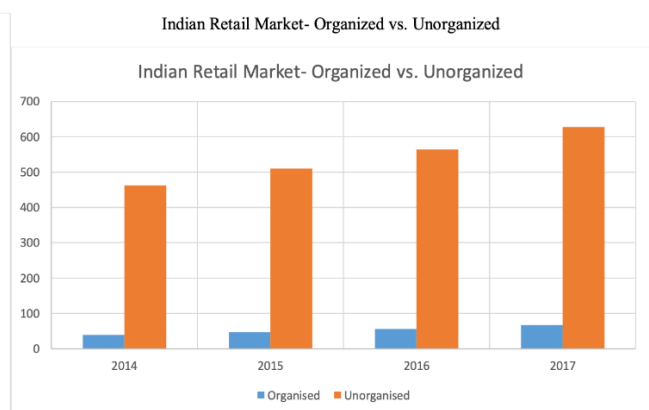
#### Introduction Of Reliance into Retail

The Reliance Retail project was unveiled in 2006, indicating the company's foray into the world of E-commerce and retail.

This division of the company is a multi-faceted beast that serves to customers from a variety of retail and e-commerce businesses.

### 5.2 Company's disruption in the Online Retail Market

India has a **high range of unorganized market** and with the moving years the competition has increased for the number of players in the organised market as compared to unorganized market as the technology era dawns upon the world of retail. With major competitors like Amazon, Flipkart, Walmart – **RIL decided to quickly move into the retail & E-commerce market** – and with careful strategies and marketing have become the largest retailers in the sub-continent.



**JioMart and Reliance Retail have converted to an Alibaba-developed O2O (Online to Offline) business model which is built on an online-to-offline (O2O) approach, in which users make purchases online and have things delivered by local shopkeepers.**

They entered the E-commerce market with Ajio.com (Apparels), reliancedigital.in (Electronics) and the JioMart App (Daily necessities & One Stop App), which collectively dominate India's E-commerce market which offers a wide range of products and subsidiary brands.

### 5.3 Technological Advent by RIL

## Technological revolution at RIL

## 1. AI, Metaverse & Deep-Learning - Two Platforms & InMobi



**Two Platform** will collaborate with Jio to accelerate the adoption of innovative technologies including artificial intelligence, the metaverse, and mixed worlds. To obtain access to their innovative technology, several deep-tech start-ups have received funding or been bought by large corporations. It plans to first employ its interactive AI technology in consumer applications, then entertainment and gaming, as well as enterprise solutions such as retail,

services, education, health, and wellness.

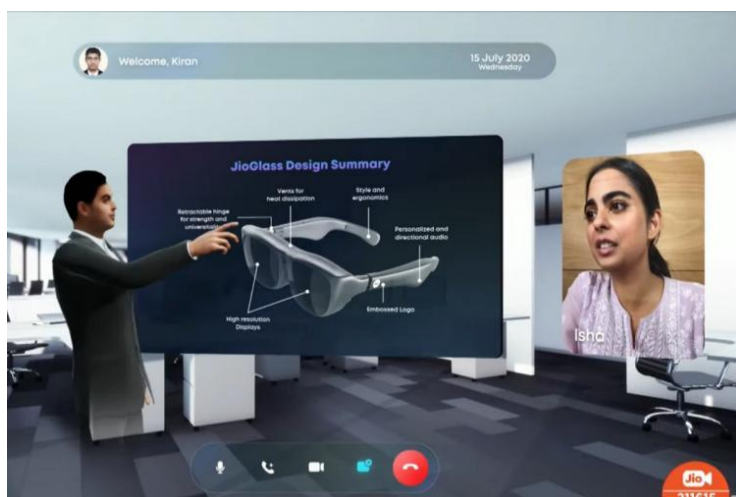
**InMobi** - To capitalize on the depressed market and expand its footprint in the country by leveraging data and trends collected via their AI acquired firms – InMobi – and targeted 70 percent growth in 2020. Reliance Retail leverages data analytics and artificial intelligence to supply store-specific selection.

## 2. Smart Glasses - Tesseract

India's largest mixed reality startup, Jio Glass, is an MIT Media Lab spin-off and a private division of Reliance Industries Limited. Jio Glass is built on mixed reality and is powered by both cellular and wireless networks via the attached phone.

Jio Glass is about to be released at a very low cost, bringing technology to every home in India.





### 3. **Drone Technology - Asteria**

Asteria Aerospace, a Jio Platforms subsidiary, has introduced SkyDeck, an end-to-end drone operations platform.

SkyDeck is a cloud-based software platform that provides a drone-as-a-service (DaaS) solution for a variety of industries, including agriculture, surveying, industrial inspections, and surveillance and security.

SkyDeck offers a unified dashboard and services for drone fleet administration, drone flight scheduling and execution, data processing, visualization, and AI-based analysis of aerial data gathered by drones.



### 4. **Drone Delivery of grocery, medicines & vaccines - Dunzo**

In Jan 2022 – RIL acquired Dunzo - Restaurant, health and grocery delivery company will soon be able to deploy drones to deliver such items during the Covid-19 pandemic that is presently ravaging the country. Trials have already started for Beyond Visual Line of Sight (BVLOS). BVLOS is the second stage of testing drones and unmanned aerial vehicles (UAVs) in India.

Once these trials have proven successful, drones can then be deployed for delivering Covid vaccines, medicines, and food.



## 5. Warehouse Robotic Innovation & Automation – Addverb Technologies

Addverb Technologies, a robotics business based in Noida, has secured a \$1 billion robot order from Reliance Retail. The order includes - a fleet of Dynamo 200 bots will be included in the order.

The robots will be placed at Reliance Industries' (RIL) Jamnagar refinery and controlled remotely from RIL's Mumbai headquarters. The business also stated that it will assist in the scaling up of its robotic products in omni-channel distribution centers across a variety of industries, including e-commerce, retail, grocery, fashion, pharma, digital, and petrochemical. The two businesses also intend to work together on developing 5G robotics and battery systems, as well as leveraging carbon fiber to create more accessible and intelligent robots.



## 6. Radisys

In India, Reliance Jio competes with Airtel and Vodafone as a mobile service provider. Radisys was purchased by Reliance for its open-source architecture and an addition of 5G and IoT.



### Acquiring Tech Firms – to create an In-house Revolution and leverage the Technology

**Reliance is infamous for how it takes over the market, and that is by targeting and acquiring start-ups and businesses by the bucket full.** Different branch-offs like Reliance Trends, Reliance Digital and so on, a lot of its success is attributed to the heavy absorption of other businesses which are brought under the brand umbrella.

**Because majority of these companies already have a certain level of market reach and functioning business models, Reliance essentially adds value to them by using its brand name, reach, and resources.** A good way to envision that tactic is to look at these companies as the tool or vehicle that Reliance uses to expand its reach in the various industries. It is an effective and smart model.

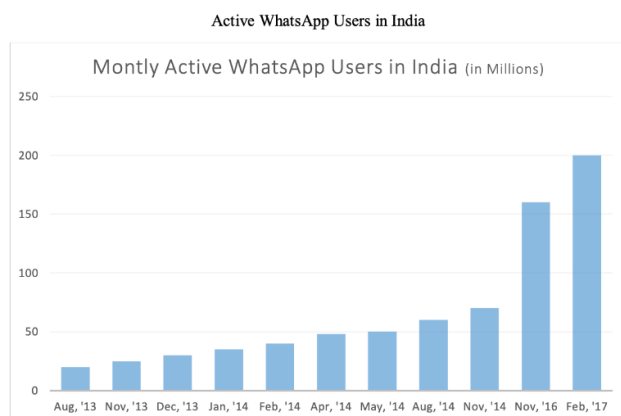
To that end, RIL has made some notable **Technology & E-Commerce start-up acquisitions**, including:

Year	Companies Acquired
2018	<ul style="list-style-type: none"> <li>• <b>Embibe</b> - Powerful AI-powered learning platform</li> <li>• <b>Saavn</b> – India’s Largest Music Streaming Service,</li> <li>• <b>Vakt Holdings Ltd.</b> - UK-based Blockchain startup</li> </ul>
2019	<ul style="list-style-type: none"> <li>• <b>Fynd</b> - Fynd: Online Shopping Platform</li> <li>• <b>Grab</b> – App based on-demand and same day logistics company.</li> <li>• <b>Haptik</b> - Conversational AI platform to build powerful Intelligent Virtual Assistants &amp; Enterprise CX platform</li> <li>• <b>Tesseract</b> - India's biggest mixed reality company – currently building India’s first smart glasses called Jio Glass.</li> <li>• <b>Netmeds</b> - Digital Pharma marketplace</li> <li>• <b>Asteria Aerospace</b> - Designs and develops drone-based solutions to transform enterprise operations using aerial data</li> <li>• </li> </ul>
2021	<ul style="list-style-type: none"> <li>• <b>Reverie</b> - Reverie is a cloud-based, language-as-a-service (LaaS) platform that helps apps and content go multilingual.</li> </ul>

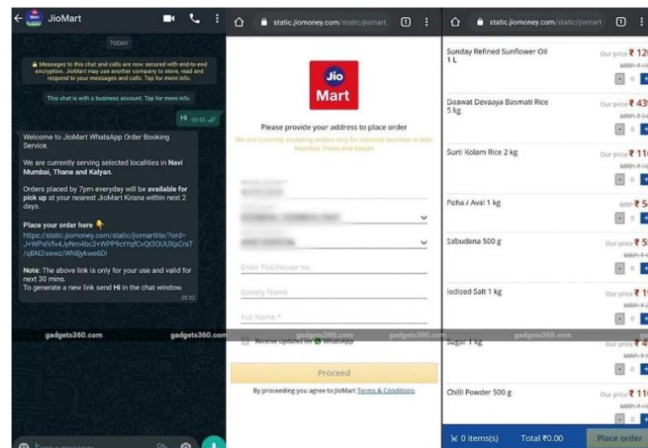
Year	Companies Acquired
2022	<ul style="list-style-type: none"> <li>• <b>Radisys</b> – Embedded Operating Systems Firm</li> <li>• <b>Dunzo</b> – Online Delivery Service – making way into Drone delivery Technology</li> <li>• <b>Two Platforms</b> – AI, Deep technology, Metaverse – to improve customer interaction</li> </ul>

## Collaboration with Facebook-owned WhatsApp

The JioMart App linked up with Facebook-owned WhatsApp to improve the brand's social media image. It's no surprise that, thanks to 360-degree perception and marketing execution, as well as aggressive brand image building, it's become a household name.



Source: WhatsApp, Mashable.



## The Hyperlocal Approach – Implementation of Alibaba’s O2O Model (Online to Offline)

They put into play the O2O model into practice – leveraging local vendors to fulfil the orders placed via their apps and websites – and in the process generating revenue on both ends.

To create a hyper local experience for its customers – RIL decided to include Farmers in marketing and growth strategy – as a novel method of approach to appease any local customer and increase its footfall in any surrounding with 2 major factors in play –

- Diversify the local shopping experience for each customer by inclusion of their local surroundings
- Reasonable pricing & service with the Reliance Brand Name

This campaign was called the – “Bettering the Lives Campaign” – which turned out be a huge hit in this sector – and increased technological intervention and revenue growth in local sectors as well.

## 6. Response to covid

In the wake of previous economic downturns, we've come to understand that they expose existing weaknesses, accelerate emerging trends, and force organizations to make structural changes sooner than they had planned on. In retail, this is especially true. Online shopping grew during the recession of 2008–2009, while brick-and-mortar retail fell. Off-price, discount, and emerging players continued to thrive as the economic recovery took hold, appealing to new consumer needs. However, we expect new trends caused by a global recession brought on by pandemic to influence this pattern. It is inevitable that retailers who are already struggling before COVID-19 will see their losses worsen. Off-brand and discount retailers will continue to draw business, and online shopping will continue to grow. The COVID-19 recession, on the other hand, was sparked by a sudden cessation of consumer spending. People simply stopped going out to eat, traveling, and doing other things that required them to leave their homes. Around 40 million workers were laid off or furloughed as demand ceased and businesses were shut down to prevent the spread of Covid. As a result of people cancelling doctor's appointments and postponing elective medical care, some sectors, such as health care, have shrunk. There had been a surge in digital retail during the first few months of the COVID-19 crisis: Those retailers with strong platforms and sophisticated data analysis have succeeded in connecting with customers and offering them additional services and value. Because of public health concerns, consumers are more open to trying out new digital experiences, such as telemedicine, online education, virtual payments, and online grocery delivery.

### 6.1 Impact of SARS COVID-19 on retail industry.

It's still unclear what the world will look like after COVID19. A V-shaped recovery has been seen in the past after pandemics, but questions remain about this one, and the economy's outlook is cautious at best. Customers are confined to their homes, where they must order food and services, review their options, and worry about getting sick. Even after the quarantines have ended, these experiences are likely to have a lasting effect on their behaviour. Accordingly, it's reasonable to expect a slow recovery in store traffic, influenced by the vaccine schedule, customer confidence, and financial concerns. Retail customer behaviour is expected to change in the following ways:

- Change in purchasing location from stores to online/curb side/mobile devices
- Leasing/renting as a long-term alternative to owning
- More returns due to customers' reluctance to try on clothing and footwear in the store.
- Switch to "touchless" payment and point of sale systems
- As budgets tighten, more people are turning to discount and value retailers.

Retailers must also address challenges and changes from an operational perspective in addition to customer-facing issues:

- Prepare for a second infection wave or new threats by enhancing operational resilience.
- Optimize inventory, prices and markdowns to accurately measure and pace the recovery.
- Continue with minimal human intervention in the supply chain and delivery process.
- Structure changes that allow businesses to cover non-core areas that are deemed "essential" and not shut down should be considered.



The retail industry's external environment has significantly altered conventional wisdom and may result in a new structure and circumstances (a "new normal"), which will have a wide range of impacts on politics, the economy, and our lifestyles, as well as the digital technologies that support these. The Japanese government issued a business continuity request for essential retail businesses that deal with food and other necessities, but many other types of retail establishments were forced to close as a result. Some experts believe that the economy will take years to recover from the effects of Covid-19. Since the government asked people to quarantine themselves, face-to-face service in retail stores has been severely restricted. As consumers, we've also had to adapt to a new way of life. When people didn't have to leave their homes to shop, online purchasing became more popular among those who had never done so before. People's work habits have shifted because of being required to work from home and interacting with others via the internet has become the norm. The pandemic has accelerated the spread of digital technology that supports the online lifestyle, which has been popular for some time. The rise in online shopping has not compensated for the decline in consumer spending.

Americans have reported a decrease in household income, and 40% say they've been more careful with their spending during the economic crisis. Discretionary purchases like clothing, vehicles, and travel are expected to decline, while the price of necessities like food and household goods will rise. Fewer than a third of American consumers are regularly venturing outside their homes, and an overwhelming majority (80%) say they are worried about their safety when they do so. Consumers are spending more money on at-home activities, such as gardening, as well as software and electronics that allow them to work (or learn) from the comfort of their homes. It is most common for people to go shopping for food and other necessities when they leave their homes.

In the US, Walmart and Home Depot are two of the largest retailers to invest in technology to support the E-commerce experience and have seen significant revenue growth. Many smaller specialty retailers had to quickly invest in E-commerce implementations because of the rise of online shopping. To provide customers with a better digital experience, retailers with established E-commerce capabilities continue to see rapid growth online. As a result, they are prudently increasing their investments in E-commerce.

Most big organizations leveraged data preciously like for Walmart for example and collected to understand ensure that customers have better experience's and improve them. Data from the point-of-sale and complex analytics have before been used by retailers to gain insight into what is selling in stores and online, as well as the preferences of customers to specific channels. It's the data from other sources that's been so helpful during COVID-19 in keeping both employees and customers safe, such as location data and indoor positioning, it is possible for retailers to gain a better understanding of how customers move around their establishments and their residences. Retailers and customers alike can now benefit from new AI technology from Voxel51 helps them maintain a distance from each other. By monitoring in-store traffic, the Voxel51 platform can tell when a location is busy. Using computer vision modelling and live video feeds, the physical distancing index measures how much human activity has changed over time in a specific location. Retailers' digital aspirations and the desire to provide richer customer experiences necessitate faster data transfer. Wireless transformations, such as 5G and Wi-Fi 6, are still being anticipated by forward-thinking retail establishments. This was the time for retailers to lay the groundwork and look at applications powered by these technologies. It is also important to note that investments in hybrid and multi-cloud systems are still being made to meet business requirements for the

movement and utilization of this data. Along with leveraging collected, the new AI technology from Voxel51 and wireless transformations, improvement of supply chain was required. During COVID-19, supply chains were severely disrupted, with many grocery and cleaning products running out of stock.

Retailers made near-real-time adjustments, including securing supply, redirecting inventory, and increasing capacity. In addition, they had to accomplish this while maintaining a fine line between responsiveness and adaptability, all the while maintaining a high standard of quality. Retailers are increasing data sharing with other supply chain stakeholders to prevent further disruptions. These problems required a lot of manual intervention to be solved. More than 100 global retailers were interviewed for a University of Warwick and Blue Yonder study, which found that retailers must invest in supply chains that are flexible, transparent, and automated. The study also found that emerging technologies like artificial intelligence and machine learning will be critical in helping retailers meet customer expectations while also navigating future disruption. The above-mentioned effects of COVID-19 necessitate a rapid increase in technology investments, both for survival and for growth. Retailers are looking inward to reduce costs in IT infrastructure and operations to pay for these technological investments. Consultancy services to analyse IT spend and utilization of currently consumed infrastructure resources and generate recommendations for near, short, or long-term cost optimization are becoming increasingly popular. Digital Integrated Infrastructure Services Platform (D2S) has been identified by Curvature as a viable option for many retail clients looking to rethink their infrastructure services while also driving innovation and saving money.

## 6.2 New Approaches for Business recovery

It's not the first time that discretionary spending has been hit hard by the recession and the recovery that follows. Unemployment claims are on the rise, and shoppers are more inclined to save than invest during this time of economic uncertainty. A slow recovery may be in store for most of the country. Recessions in the past have provided companies with an opportunity to rethink their business models. As we emerge from this crisis, there is no reason that can't be the case. Following are some important areas we see opportunities for business recovery:

**Value proposition must be revisited to get back to basics:** Most retailers face uncertain demand for the next few quarters as we begin the process of reopening the economy. If you're considering expanding the business into new markets or forming alliances, now is a great time to do so. Primark and Kohl's partnership with Amazon as a selling channel and return partner is an excellent example. Another example is Best Buy's foray into the senior care industry. It's expected that new opportunities will arise following the COVID conference. **Profitable and long-lasting digital distribution channels:** Digital channels and the concept of omni-channel retailing have been heavily invested in by retailers in response to Amazon and other challengers. Instead of being driven by competition alone, retailers can take advantage of the current crisis to develop their non-store channels (web, mobile, social) as independent businesses that drive margins and acquire net new customers. Expect online sales to take off more quickly than in-store sales following COVID-19. **Selling to "new customers" with "new technology":** Out of necessity, seniors are finding new ways to shop during this economic crisis. Is the retail industry prepared to meet the needs of this affluent demographic? Senior-friendly web and mobile sites, self-service technology that can handle high volumes of moves, and workforce retraining are all necessary for retailers to adapt to the changing needs of their customers. Millennials and Generation Z should expect to see an increase in end-user technology interventions after COVID-19. **Acquisition of**

**new customers:** During the economic crisis, 44 percent of shoppers surveyed visited new stores because of product availability and accessibility, according to a recent report. Customer acquisition can occur as a result of this, as brand loyalties are being shaken. As a result of COVID-19, retailers must now find ways to connect with and retain this new segment of their customer base through personalized interactions. **Planning with a fresh perspective:** The current situation is driving a new digital-commerce first approach, even though online penetration in retail has been steadily increasing. After the crisis, customers will stay away from stores because of either fear or habit. Historical data may no longer be an effective guide for developing strategy, planning allocation, and promotions because of this shift in behaviour. Investing in new reality-based decision models will be necessary for retailers after COVID-19. **Providing security and safety:** Safety and security have always been important to consumers. Threats to products, personal safety, or cybersecurity are all made more real by this crisis. Many consumers are willing to pay a premium for additional safety and security in the wake of COVID-19. **A supply chain's responsiveness:** Customers are demanding better service, and retailers are realizing that they need to invest in supply chain modernization, build operational resilience, and reduce their dependence on human resources. Investments in technology in distribution centres, transportation, and last-mile delivery are expected to rise significantly. We shouldn't be surprised if unmanned distribution centres and robotic deliveries gain traction after COVID-19. **Management of Cash Flow:** "Cash is king," as the saying goes, has always been the case. Most of the opportunities we've discussed here require reinvestments, which can only be made possible by having healthy cash flows. Better inventory management, more effective markdown planning, higher receivables turnover rates, and other benefits can be enabled by technology. We can anticipate that AI/ML systems will become a differentiating factor in maintaining healthy cash flows following the conclusion of COVID 19

**Here are few examples of organizations and how they adapted to covid-19 with respect to technology:**

**Walmart:** Walmart has a history of embracing digital innovation, from drone and autonomous vehicle deliveries to adding automated micro-fulfilment to dozens of stores. Customers can now select items in-store and have them shipped directly to their doorsteps using the company's Scan & Go technology and Scan & Ship app feature, which is currently being tested. Along with these, because of Walmart's partnership with Adobe, retailers can take advantage of its cloud-based pick, delivery, and fulfilment services. Walmart also began selling its white-label delivery platform



to other companies this summer, as well. They are also offering cashier less technology and it has played a huge role in making checkout easy. They also have a Me@Walmart mobile application which is basically a voice assistant called "Ask Sam". Furthermore, Shoppers at Walmart can expect personalized experiences at a large scale thanks to machine learning and artificial intelligence. Predictive baskets at Walmart,

for example, employ machine learning and artificial intelligence to learn about their customers' buying habits and preferences so they can tailor their offers accordingly. There are further uses for AI, such as alerting personnel when new checkout lines get too long and if extra registers need to be opened and when the supply of shopping carts runs short





Reliance: Jio is the only carrier that provides just 4G services while its rivals Airtel and Via offer 2G services, which are utilized for feature phones and smartphones in regions with poor data access. Also, a commercial deal has been signed between WhatsApp and Reliance Retail to speed up the launch of Reliance Retail's new commerce company on the Jio Mart platform. RIL uses Jio mart as

a platform to enable small businesses like Kirana shops better serve their customers. Jio Mart makes use of the chatbot technology where you can place order for groceries and other essentials. This helped a lot of customers during covid.

Amazon: As stores closed and shelves became bare, customers rushed to Amazon first for goods like hand sanitizer, face masks, and disinfectants to protect them against Covid-19. As the crisis carried on, they acquired office supplies and workout gear to adapt to the fact that they would be spending most of their time indoors. E-commerce services firm CommerceIQ found that during February and March, Amazon sales of toilet paper increased by 186 percent, while cough and cold



medication sales increased by 862 percent. During Covid, Amazon Web Services (AWS) helped communities by providing safe, sophisticated cloud technology and technical experience. One main advancement in amazon is the “Just walk out” autonomous checkout service in the whole foods market division called Amazon go which was introduced in September 2021. It makes use of computer vision and deep learning which are part of AI/ML. Just Walk Out technology has been expanded to accommodate all the

Whole Foods store's inventory, including self-service, at this new Amazon Whole Foods site. Using the Just Walk Out concept, consumers will be able to purchase self-serve options such as cola and ice cream and just walk out at the new location. With the launch of Just Walk Out, consumers at Whole Foods may utilize the Amazon One palm-based payment system as well as a credit or debit card linked to a customer's Amazon account to pay for their purchases. Use the self-checkout lanes if you only have cash, prepaid cards, gift cards from Whole Foods Market to make your purchase.

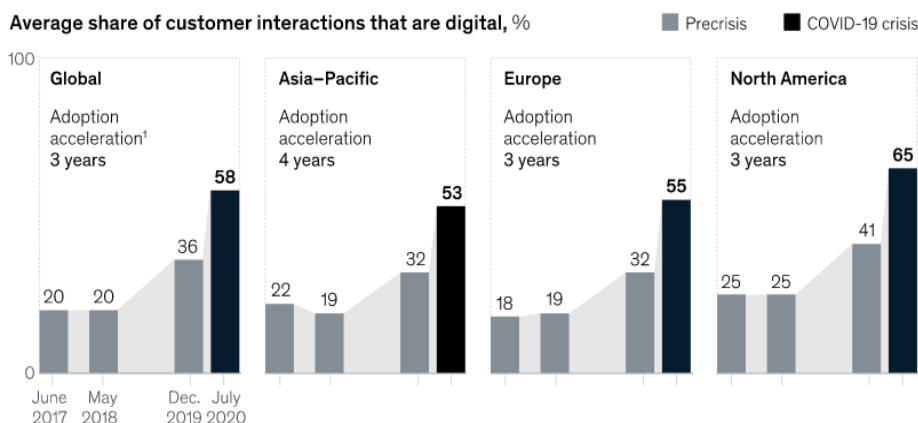
## 6.3 Consumer Empowerment by Technology

A major shift in consumer behaviour has occurred during the pandemic, and businesses have reacted accordingly. The results of a survey taken show that customers are increasingly preferring to communicate with businesses via digital channels. As a result of these findings, adoption rates in developed Asia are far ahead of where they were when previous surveys were conducted. Since the financial crisis, respondents are three times more likely to claim that at least 80% of their customer interactions are digital.

When it comes to purchasing, customers use a variety of digital touchpoints. Shoppers use search engines, social media feeds, and influencers to get product inspiration outside of a brand's properties during the discovery and evaluation phase of the journey. New types of purchase points are emerging in the buying phase of the journey. When it comes to making purchases, mobile wallets trail only e-mail in popularity. In addition, 14% of consumers make purchases after researching products on social media. This pandemic-induced surge in E-commerce was no

hiccup, according to credit and debit card data gathered since January 2020. Future technology is here to stay. A whopping 92% of consumers who tried online shopping in 2019 became believers, turning emergency response into a necessary habit for them all moving forward. Even traditionally tactile shopping experiences like grocery shopping have seen a significant increase in popularity thanks to the rise

**The COVID-19 crisis has accelerated the digitization of customer interactions by several years.**



of E-commerce. Customers with a sense of empowerment are more willing to try out new brands and products. 56 percent of online adults in the United States admitted to a voracious appetite for novelty last year. Customers who feel empowered are more likely to purchase high-tech gadgets that boost productivity and efficiency. Over two decades ago, most online adults in the United States lacked access to a personal computer (PC). Many people now use their smartphones as well to look up grocery stores and order online or pick their groceries up. Increasing personal-use technology has made it possible for consumers to perform a wide range of tasks on a variety of new channels, such as mobile phones, tablets, and voice assistants. Customers expect consistent business interactions across channels and 98 percent switch between devices on the same day, so brands must meet their customers wherever they are.

E-commerce is on the rise and has been steadily increasing over the last few years. People are increasingly reliant on their smartphones, and so B2C brands need to be able to adapt their websites to work on mobile devices. Online shoppers benefit from the ease of conducting product research and placing orders via mobile devices that are specifically designed for E-commerce. A mobile interface is being used by businesses to implement new technologies and give customers

more personalized and engaging experiences. Artificial intelligence, virtual reality, and augmented reality (AR) are increasingly being incorporated into mobile apps to provide customers with more immersive shopping experiences. Virtual visualizations allow consumers to test out a wide range of products and services before making a purchase.

Brands and consumers benefit from these new technologies because they can get a better understanding of the inner workings of the brand. Businesses and customers need to be able to converse with one another to provide better experiences. Using automation, client and business-to-business scheduling tools, and other methods, companies have been able to better serve their customers. Chatbots have revolutionized B2C communication because most customer support teams lack the manpower to respond to the 24/7 influx of requests that technology has enabled. Chatbots can save up to 60% of phone support time for customer issues. Customers can get answers to their questions, product recommendations, and more from these intelligent bots via simple messaging apps. An excellent customer service asset, chatbots can handle multiple conversations at the same time while also gaining knowledge from customer interactions. Consumers can now use voice search to search for answers to their questions without having to put their hands on the keyboard. When it comes to online shopping, 40 percent of millennials already use voice search, so there's an argument for businesses of all kinds to get ready for this new age. Using visual search is another recent trend. Many E-commerce sites now include image search functionality so that customers can look for products by taking pictures of them and uploading them to a database of websites that sell them. Customer satisfaction is the ultimate goal of any business. We live in a world where technology is constantly evolving, and this means that the relationship between businesses and consumers will be affected by an endless stream of changes.

## 6. Conclusion

Walmart right now are doing great work with respect to implementing technology to help their customers as much as they can. As for Reliance, they are still in the developmental stages of being as good as Walmart when it comes to retail with respect to implementation of technology. Maybe in 5 years reliance might be able to compete with Walmart.

Large-scale, concentrated, centralized, and sophisticated retailing have all emerged. Retailers are well on their way to gaining control of the supply chain. Developing strong retail brands, which generate long-term consumer preference and loyalty and create sustainable differentiation between direct retail competitors, will be the next major challenge and opportunity for retailers in the future. It is impossible to generalize about the state of retail brand development in different countries and retail sectors because of this. UK and US retail brands are some of the strongest, including perhaps the strongest product retailing brand in the world.

Following the COVID-19 pandemic, the role of technology in retail has expanded dramatically. To stop the spread of the coronavirus, many brick-and-mortar retailers have been forced to shut down their physical stores and move more quickly toward technology-based solutions like online ordering and fulfillment, click and collect, and robotically assisted operations.

The pace of change in technology is rapid. Many of these innovations are having a significant impact on the retail industry. Retailing is being reshaped by new technologies such as micro-cloud computing, robotics, 5G, VR, AR, MR, IoT, and drone. New and unexpected circumstances can be dealt with in the COVID-19 world because of technology.

However, even though this crisis is unlike anything we've seen before in our lifetimes, the human spirit will endure and together we'll be stronger. "This, too, shall pass," sang the Sufi saints of old. Although we believe that structural challenges to consumer behaviour, technological changes, supply chain, and fulfilment capabilities will occur, they are not yet clear in scope and magnitude. Companies with good cash flow and debt-to-equity ratios will have an advantage, but it is crucial to make strategic investments in technology, partnerships, and other areas of strength as well. To find the best solution for your company, there is no one-size-fits-all approach. Everyone has a chance to shine in retail, which is all about execution and at this point investment in technology is a must.

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