CHAPTER-TWO

MOBILE COMMERCE:

AN OVERVIEW

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2.0 INTRODUCTION:

In many countries, the development of mobile phone technology has drastically improved people's lives and business functioning, turning mobile phones into a necessity for daily activities. Mobile devices, for a long time, have been used for entertainment and voice calling. Still, the advancement in technology like the Fourth and Fifth Generation mobile network technology (4G/5G) has opened up the avenue for Mobile Commerce, or m-Commerce (Pagani,2004[1]; Kini and Bandyopadhyay, 2009[2]).

In the 21st century, all aspects of our life and lifestyle involve Information and Communication Technology (ICT). ICT affects the implementation of marketing strategies in a business environment and shapes industry structures. Wireless communication technology in mobile, an important advancement in ICT, is widely applied in the industry as it removes most time and places restrictions on communication, which extends the reach of services in remote areas and allows people to carry out tasks like ordering products, checking their e-mails, buying services from anywhere without the need for computers (Aungst and Wilson, 2005)[3].

Despite the predictions supporting m-Commerce becoming a mainstream business application, some people think otherwise and doubt its return-on-investment (ROI) potential. Issues including credit card security, low access speeds, cost of access, and difficulty in navigation hinder the usage and application of m-Commerce (Smith, 2001)[4]. There is plenty of literature discussing the various issues in the marketing of m-Commerce technology (Barnes, 2002[5]; Kumar and Zahn, 2003[6]), but there is a need to study the factors that influence m-Commerce adoption (NG-Kruelle et al., 2002[7]; Coursaris and Hassanein, 2002[8]). As such, this research aims to find out what motivates people to use mobile commerce in their daily lives. The study aims to analyse and examine the prospects of m-Commerce to determine its future potential. This would be done in India, a market with a well-developed telecommunications infrastructure and pro-technology policies. This study will aid in the rapid development and evolution of the country's m-Commerce sector, assisting marketers in developing appropriate strategies to ensure better adoption (Yang, 2005)[9].

"The adoption of mobile technology does not follow any universal logic or pattern", according to Dholakia and Dholakia (2004)[10.] There is such a variation due to various factors including the differences in the telecommunication infrastructure, the general marketing strategies used by the service providers, and the difference in the culture of usage among people. This study aims to explain why Indians, especially the people of Gujarat, have decided to adopt m-Commerce. As the studies examining m-Commerce adoption in India are limited, this study would be very useful to companies offering m-Commerce services to know what factors draw consumers toward this medium.

2.1 MOBILE COMMERCE: CONCEPT:

Innovations in technology have drastically affected the ways we live. With a marked shift towards online shopping, transaction methods have been highly simplified and are quicker and more productive, resulting in better customer satisfaction. Given the pace of innovation, it is hard to imagine how technology will touch people's lives in the future. Very few aspects of our lives will not be influenced by the internet (Barnes, 2002)[5]. In the past decade, the rapid development of telecommunication technology was followed by growth in mobile apps. The mobile environment has become more supportive, and internet providers now strive to attract user interactions (Buyukozkan, 2009)[11]. Mobile Commerce (MC) is quickly becoming a crucial application in business and for the people due to the development of better wireless technology and the ever-increasing strength, speed and range of the Internet (Pascoe et al., 2002[12]; Wu and Wang, 2005[13]).

Businesses must offer marketing channels for their customers, and mobile phones provide an excellent avenue. Mobile phones, with their ever-increasing popularity, are an important channel for businesses to directly market their products and increase their sales and consumer base (Barutcu, 2008)[14].

Business transactions carried out in any hand-held device, whether a PDA or mobile phone, come under the definition of m-Commerce. Siau et al. (2001)[15] define m-Commerce as "a new type of e-commerce transaction conducted through mobile devices using wireless telecommunication networks and other wired e-commerce technologies"; Clarke (2001)[16] gave the definition "the application of wireless communications networks and devices to the execution of transactions with monetary value"; Tiwari and Buse (2007)[17] have defined it as "any transaction, involving the transfer of ownership or rights to the use of goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device".

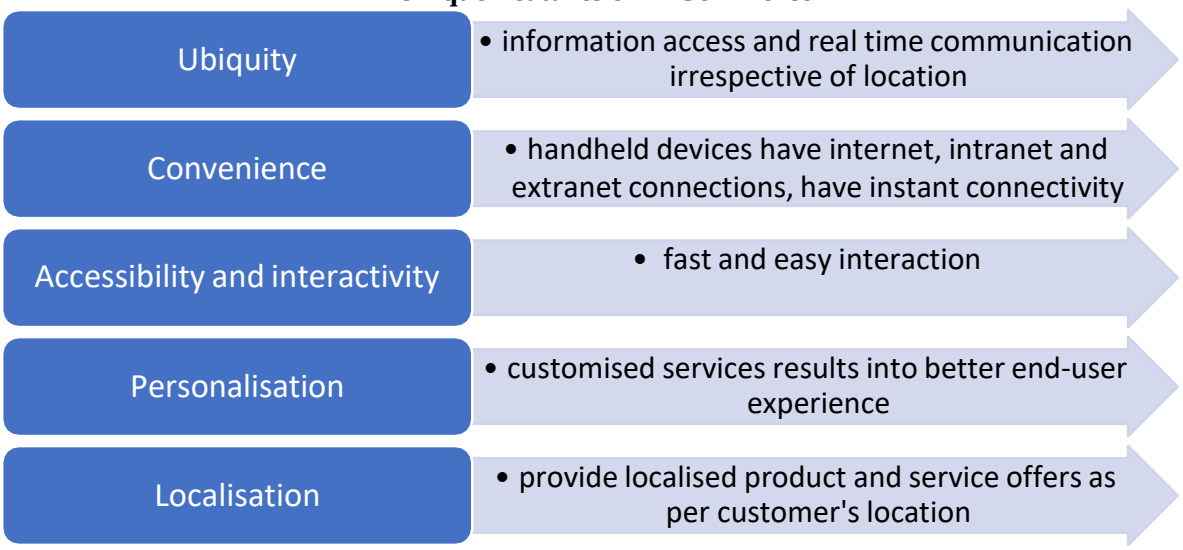
The definition given by Wu and Wang (2005)[13] is "A transaction with or without monetary value implemented via a wireless communication network that includes mobile banking, retail shopping, investing and other web services". Elliott and Philips (2004)[18] define m-Commerce as "wireless B2B, and B2C exchanges of operational and financial data within a supply chain at different stages of the life cycle of a business relationship-Commerce are not limited by time or place, and the wireless nature allows it to replace other commerce forms, leading to it being termed "ubiquitous commerce" (Pavlou et al. 2007)[19].The definition given by Durlacher (2000)[20] is the most popular, which defines m-Commerce as 'Any transaction with a monetary value - either direct or indirect - that is conducted via a wireless telecommunication network'. The similarity with e-commerce lies in exchanging goods of some monetary value. The difference lies in the technology for m-Commerce, primarily mobile phones, rather than the internet. Heavy investments have been made in m-Commerce and mobile marketing, but there is a lack of clear understanding of the factors involved.

Thus, despite the increased prevalence and acceptance of m-Commerce, businesses will find it challenging to generate profits consistently without a clear understanding of the factors and the dynamics involved. The rapid development and diverse potential applications make m-Commerce an attractive field for conducting research. Applications in m-Commerce are characterized by portability and broad reach (Sadeh, 2003)[21]. Financial services such as banking, payment and brokering, entertainment options like music, betting, and gaming, shopping services such as ticketing, auctions and retail, and information services such as news, maps, and weather forecasts are all common applications of Business to Consumer (B2C) m-Commerce (Khalifa and Shen 2008)[22].The increasing popularity of these applications can be attributed to greater connectivity, cheaper handsets with ample technology, a sharp increase in the growth of telecom markets, a rise in disposable income among the masses, and a growing demand for new services, especially among the youth. Consumers are the key success factor for such services. There has been an increase in the application of technology to enhance service quality, reduce costs, and improve overall customer satisfaction, which then aids in the retention of customers for the business, making further in-depth research into the field crucial for the business to succeed. m-Commerce is often considered e-Commerce but carried out on mobile devices (Varshney and Vetter, 2002)[23].However, the value chain, mobility, broad reach and the pattern of usage interaction set the two apart.

2.2 ATTRIBUTES OF M-COMMERCE

According to Turban and King (Turban et al., 2006)[24], the main attributes of m-Commerce are ubiquity (the location does not affect the ability to conduct transactions to a large extent); convenience (with the ability to procure services through mobile devices); localization (getting location-specific services using GPS technology); accessibility (the customer is not bound by time and location) and personalization (companies can use m-Commerce to tailor information and services specific to every customer's needs).

Figure Number 2.1:
Unique Features of m-Commerce



Source: Xiaojun et al. (2004)[25].

Despite the conflicting opinions regarding the adoption and effect of m-Commerce, some researchers agree that the economy has negatively affected the seemingly disappointing development and deployment of m-Commerce services. The various positive attributes mentioned should set a precedent for a widespread acceptance of m-Commerce. However, it has been shown that the acceptance is slow and perceived as expensive with poor usability and service (Mylonakis 2004[26]; Jarvpenaa et al.2003[27]). Many articles and research papers talk about the immense potential of m-Commerce and how it assists businesses and content creators (Varshney and Vetter,2002[28]; Siau et al., 2001[15]; Barnes, 2002[5]; Lembke, 2002[29]). Conversely, some articles claim that m-Commerce adoption has been slow despite the promise and that the field has failed to deliver down (Patrova,2004)[30]. Whether m-Commerce turns into a crucial source of revenue or not is a question that does not have a convincing answer yet (Rupp & Smith, 2002[31]; Petrova, 2004[30]).

2.3 HISTORY AND GROWTH OF MOBILE COMMERCE

The phrase “mobile commerce” was coined at the Global Mobile Commerce Forum (Duffey,1997)[32]. The forum was launched on November 10, 1997, and was led by Kevin Duffey as the Executive Chairman. He defined m-Commerce as "the delivery of electronic commerce capabilities directly into the consumer’s hand, anywhere, via wireless technology”. Kevin Duffey, who was the Group Telecoms Director of Logica, and Tom Alexander, who went on to be the CEO of Orange, gave the initial prediction regarding m-Commerce. Over a hundred organizations participated in the forum, many of which went on to be involved in m-Commerce themselves, with Cellnet (which then turned into O2) and Logica being the first two companies to do so.

The delivery of the first m-Commerce services started in 1997 in Helsinki, Finland, with two Coca-Cola vending machines with mobile phone support, enabling payments through SMS service. In the same year, SMS was also used by Merita Bank of Finland to start the first banking service that utilized mobile phones. Finland also witnessed the birth of content distribution and product sales through mobile phones in 1998 when Linja Radio launched ringtones that could be downloaded to mobile phones. 1999 marked the start of mobile payments in the Philippines and the first mobile internet platform introduced by iMode in Japan as NTT DOCOMO, which was a game-changer, as the company just retained 9 percent of the net amount in the payment, and the rest of the money goes to the consumer. There was rapid growth and spread of m-Commerce applications in the following years, with airline tickets, train tickets, and even parking facilities sold through mobile phones in countries like Australia, Norway, and Japan.

The rapid development of mobile technology followed the humble beginning and m-Commerce applications are ubiquitous in the current market, with more than 5 billion mobile phone users worldwide. Mobile phones have become sleeker, feature-rich, and have powerful computational capabilities. m-Commerce services have shifted from SMS to a plethora of applications in operating systems such as Android and iOS. Applications are no longer limited to sales and promotions and now provide various services, including music and gaming.

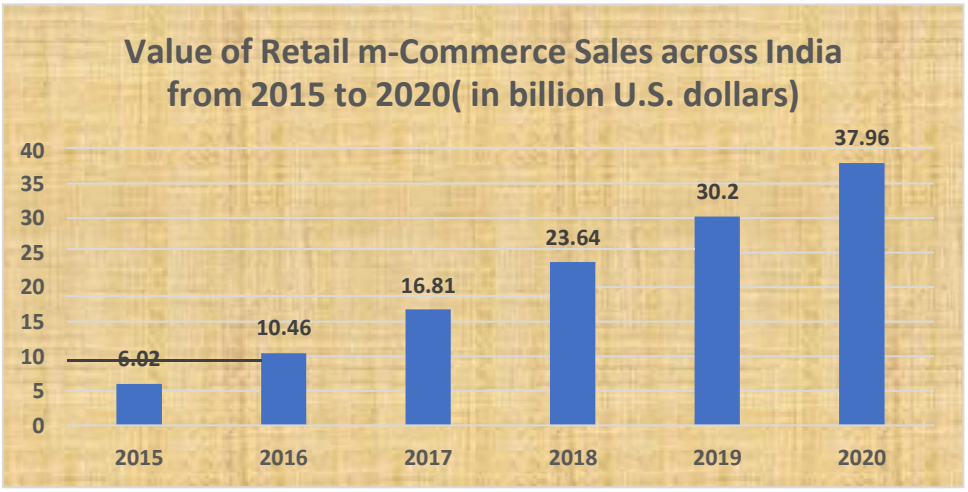
The mobile phone is no longer just a hand-held device used to make calls; it is now an integral part of the current lifestyle. With it playing such a crucial role in daily lives, consumers are looking forward to performing more and more activities using their hand-held devices, creating a strong demand for the growth and development of m-Commerce.

Graph 2.1:
Share of Global B2C m-Commerce sales as a percentage of e-Commerce Sales

Source: Coppola (2022)[33]

From 2016 to 2021, this statistic shows the share of mobile retail commerce sales as a percentage of total retail e-commerce sales worldwide. m-Commerce is anticipated to generate 72.9 percent of all retail e-commerce in 2021, up from 58.9% in 2017(Coppola,2021)[33]. This trend is largely driven by emerging e-commerce markets in mobile-first economies.

Graph 2.2:
Value of B2C m-Commerce Sales across India from 2015 to 2020(in billion U.S. dollars)



Source: Statista (2021)[34]

Mobile retail e-commerce sales in India were estimated to be valued at nearly 38 billion U.S. dollars by 2020, from just 6 billion in 2015 (Statista,2021)[34].According to e-marketer, the share of m-Commerce in retail e-commerce in India, which was 58.5 % in 2015, reached 80% in 2020 (Statista,2022)[35]. With the rapid expansion of mobile internet users since the launch of Digital India and the rise of Reliance's Jio, Indians have been able to catch up to other major economies in terms of partaking in in-store mobile checkouts with retailers' apps. Furthermore, the emergence of mobile wallets and the ability to buy almost anything online have increased the convenience of using a mobile phone. Younger generations, particularly millennials, account for the majority of mobile consumers that shop online (Statista,2022)[35].

Graph 2.3:
Share of B2C m-Commerce sales as a percentage of e-Commerce Sales in India

Source: Statista (2022)[35]

2.4: M-COMMERCE VS E-COMMERCE:

In today's fast-paced life, customers demand faster, compatible and highly efficient wireless technology that can be used on the move. m-Commerce, which allows the standard e-Commerce activities to be carried out in small hand-held devices in a time and location-independent manner, is the solution to such needs. The mobility of the services, user-friendliness, ubiquity, and location-based information and services, gives m-Commerce an advantage over traditional e-Commerce; thus, despite m-Commerce being a part of e-Commerce, the two have a fundamental difference that set them apart (Bai et al. 2005)[36]. e-Commerce is the sale of services and products using Personal Computers (PCs) and laptops through the internet. m-Commerce is considered to be the sale of products and services through handled devices with an internet connection, like tablets and smartphones (Singh and Srivastava, 2019[37]; Duhan and Singh, 2019[38]).

Some researchers argue that m-Commerce is just an extension of the former (Ngai and Gunasekaran, 2007[39]; Wei et al.,2009[40]), whereas others say that it is much more, with its different usage patterns, customer dynamics, unique services, design choices and strategies that are drastically different from that involved in e-Commerce (Feng et al., 2006[41]; Mahatanankoon et al., 2007[42]). The unique characteristic of m-Commerce changes the use pattern and provides unique business opportunities. e-Commerce services usually require equipment with a wired user interface, which makes the setup expensive and limiting its reach. m-Commerce utilizes wireless technology and the consumer needs a mobile phone or any hand-held device to access the required services. A hand-held device like a mobile phone is usually owned by a single person, allowing m-Commerce applications to provide personalized services and information (Schwiderski-Grosche and Knospe, 2002)[43]. m-Commerce is thus relatively inexpensive, has immense potential in expanding to developing nations, and allows smaller companies to extend their reach to a larger pool of potential customers (Schwiderski-Grosche and Knospe, 2002)[43] m-Commerce is ubiquitous, highly personalized, convenient, and mobile, making it distinct from traditional e-Commerce services (Shrivastava et al., 2019[44]; Clarke III, 2001[16]).m-Commerce has also empowered customers and has made them conscious and more vocal about their choices and preferences by giving them a platform to voice their concerns instantly (Lin et al., 2014)[45]. m-Commerce has revolutionized marketing. It is the future and should not be treated as a mere extension of e-Commerce (Zhang et al., 2002)[46] .

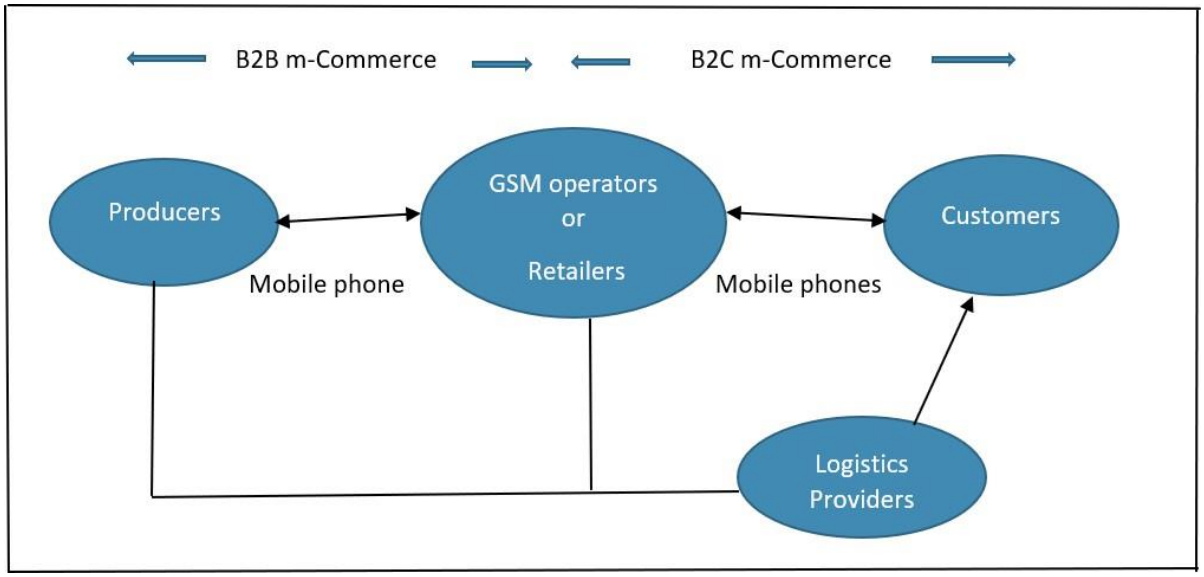
Figure Number 2.2:
e-Commerce Versus m-Commerce

Source: Wu and Hisa (2004)[47] as cited in Barutçu(2008)[48].

2.5: COMPONENTS OF M-COMMERCE:

m-Commerce consists of two main components: Business-to-business (B2B) and Business-to-customers (B2C). The B2C component consists of the consumers, the businesses, the GSM operators, and the services handling logistics. The businesses and the GMS operators focus on creating attractive offers to sell their services to consumers who own hand-held devices. Consumers use mobile phones to make transactions and to order services and goods. The logistics operators ensure that the customer receives them in time (Casal et al., 2004)[49]. Thus, B2C m-Commerce requires communication and a trusting relationship between the various partners like GSM operators, logistic providers, retailers, customers, banks etc**.** It is also crucial for businesses to be aware of the target customers and the location-dependent demands for various services (Barutcu, 2008)[48].

Figure number 2.3:
Components of m-Commerce



Source: Barutcu (2008)[48]

2.6: APPLICATIONS OF M-COMMERCE:

m-Commerce services remove the need for PCs or a wired connection interface and require the consumer to have a mobile phone with WAP enabled. The plethora of services companies provide turns mobile phones into a powerful business tool, making it possible to conduct transactions with a single touch anywhere in the world with accessible wireless internet. Mobiles can now be used for buying tickets, reserving restaurants, procuring services, and even ordering food, to name a few examples.

Many banks in India now offer m-Banking services, allowing customers to pay various bills and tickets using their phones. Most businesses also utilize the SMS service to provide information like payment confirmations or new promotions. Bharti Airtel was the first company to launch 4G LTE in India. It was also the first telecom service provider to launch an m-wallet, which allows people to deposit some money and use it to pay for different services, followed by rapid industrial development.

Now m-Commerce includes banking, marketing, ticketing, shopping, information and entertainment services as given below:

Mobile Banking: Clients can use phones to initiate and/or complete banking tasks. Most Indian and foreign banks provide this service. Customers can use mobile banking to check account balances, send and receive money, and pay bills. Loan approval and insurance policy linking are now available in some banks' mobile banking apps. Services such as mobile banking through mobile applications (for example, SBI Yono), SMS-based mobile banking and Unstructured Supplementary Service Data (USSD) for Mobile Banking are offered by banks to their consumers. Mobile banking facilities include checking account balances, transaction history, e-statements, loan and card statements, and e-Passbooks and making payments and transferring funds. Add someone as a beneficiary or use the UPI (Unified Payments Interface) to transmit money Payments via NEFT/IMPS/RTGS/UPI/MMID and give standing instructions for periodic payments covered. It also helps open fixed deposit accounts, invest in mutual funds, and manage portfolios (e.g., SBI Capital Securities). Other mobile banking options include ATM and branch locators, A fresh cheque book order, and a complaint/tracking request (paizabazar,202)[50]. While most banks utilise a dedicated app for mobile banking, others have begun experimenting with chatbots and messaging tools.

M-ticketing: With apps like MakeMyTrip and Clear Trip, customers can now plan their entire trip, including scheduling, cancelling, and maintaining their tickets, using their phones. The travel industry also utilizes m-Commerce to notify customers of all the information regarding ticket information, scheduling changes, and the necessary arrangements to make in such a case, for example. Indian Railway Catering and Tourism Corporation (IRCTC) has a mobile application that people can use to book train tickets and check the train schedules and their PNR status. The Indian Railways Mobile Ticket application, accessible on Android and iOS platforms, has received high praise for its usability and customer experience, earning a four-star rating on the Google Play Store. The UTS (unreserved ticketing system) Mobile application has 1.47 million registered users. The UTS app (also available in Hindi) allows travellers to book suburban railway tickets in less than 10 minutes. Passengers can put money into their R-wallets, book single-journey tickets, and produce and renew passes using this app. According to an IE survey, around 80,000 to 1 lakh daily average commuters use mobile tickets in Indian Railways' Central and Western zones (Nag,2018)[51].

Mobile retailing: Online shopping is now a huge part of m-Commerce. Customers can now browse through a huge catalogue of products, place orders, pay it online, and get them delivered to their homes and offices through their mobile phones. Retailers also contact customers near their store locations with information regarding pricing, discounts, and offers through mobile apps or SMS. Today's consumer is more open to using a mobile device to make purchases than in years past. Consumer confidence in data safety and increasing data storage are influencing variables. As a result, mobile users download more apps and convert more frequently from browser to buyer.

The mobile monetization gap, which refers to the difference between the gap in mobile browsing and purchasing, has now been reduced, which will benefit both retailers and consumers. To increase consumer usability and overall experience, leading retailers have upgraded mobile app design, allowing customers to complete purchases in-app rather than browsing on the phone but purchasing on a desktop. Modern businesses have gradually increased their usage of AI to convert visitors into buyers. Chatbots and mobile messaging capabilities will further grow, contributing to the shift from shops and desktops to mobile commerce. Mobile payments with saved payment information are reducing the pain point at check-out for consumers. With 5G networks, buyers can view products faster, stream HD films, and consume material more quickly, providing mobile devices with the same advantages as desktops. Enhanced mobile broadband, ultra-reliable low latency communication, security, enormous machine-type communications, and power efficiency are five primary functional drivers of 5G. The advent of 5G will accelerate the development of artificial intelligence, augmented and virtual reality experiences, and the digitalization of a brand (Shelley E. Kohan,2020)[52].

Mobile Advertising: With the increasing use of smartphones and mobile devices, multi-pronged advertising tactics are needed to attract consumers on the go. Mobile advertising is gaining traction among marketers in the digital marketing industry. As mobile becomes a key digital device for accessing the internet, marketers look to mobile marketing as a driving force. Mobile marketing automation is rapidly helping firms personalise their ad campaigns and better target their customers. Mobile marketing automation allows organisations to optimise consumer campaigns, interact in real-time, increase ROI, and assure effective consumer engagement and retention. According to a new report by an advertising agency, Dentsu India, titled Digital Advertising in India 2022, digital advertising in India is expected to equal and possibly surpass television advertising by 2023. The survey also discovered that out of the 93,119 crores predicted for total advertising, digital advertising will account for 35,809 crores by 2023, a 14.75 percent CAGR. The report predicts that the advertising industry will grow 14.6 percent to 81,025 crores by 2022. According to the research, digital advertising climbed from 15,782 crores in 2020 to 21,353 crores in 2021. Digital media is expected to increase at a CAGR of 29.5% by 2023 (Varuni Khosla, 2022)[53]. In 2021, mobile devices will account for 75% of digital advertising spending. In 2019, India spent over 64 billion rupees on mobile advertising, which was anticipated to reach 304 billion rupees by 2023 (Tanushree Basuroy,2021)[54].**M-Payments:** Mobile payments in India are growing faster than card payments as more consumers and businesses started adopting them. While most transactions handled by payment apps include peer-to-peer transactions, mobile payments are increasingly becoming a popular payment choice for retail transactions at the point of sale and online. There are many different ways in which payments can be carried out using mobile phones: browser-based payments, Mobile or wireless credit card readers, In-app mobile payments and Contactless mobile payments or mobile wallets. UPI comprises 60 percent of the total payments by volume, and digital payments have risen from $61 billion in FY 16 to 300 billion in FY21(Sunainaa Chadha,2021)[55].

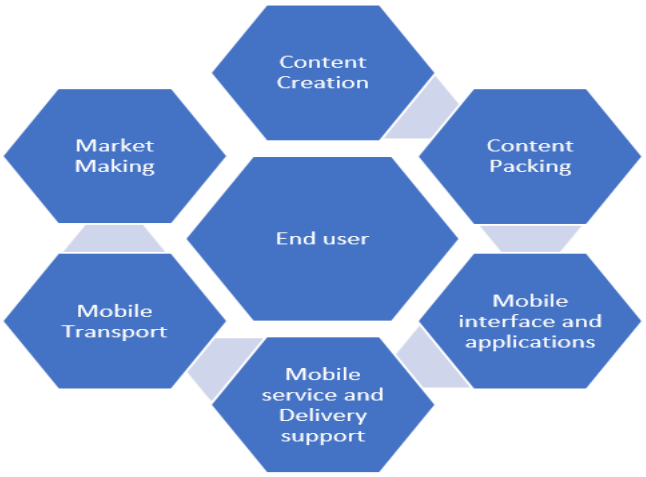
According to the India Mobile Payments Market Report published by S&P Global Market Intelligence's Financial Institutions Research team, payments made via apps that bypass credit card rails rose 67 per cent to $478 billion in 2020 (thehindubusinessline 2021)[56]. The value of digital payments in India will grow three-fold to touch $ 1 trillion by the financial year 2026 according to a report by CLSA (Sunainaa Chadha,2021)[55]. **Mobile health:** The expansion of the mobile healthcare market in India has been aided by the rise of digital technology and supportive government regulations. As a vital partner, the Indian government has developed effective policies and projects to strengthen the sector. The advent of corporate wellness initiatives is expected to be critical in propelling market expansion. Wearable devices and healthcare apps track users' health data, allowing companies to take preventive measures to lower insurance costs. The adoption of mobile healthcare to address the gaps in the traditional healthcare ecosystem has been reinforced by a number of benefits, including patient-centric care, proactive response, greater access, and lower costs. Disruptive technologies such as the Internet of Things (IoT), the Internet of Medical Things (IoMT), artificial intelligence (AI), and machine learning are expected to be implemented in mobile healthcare in India. Remote monitoring, ICU vitals monitoring, ambulance vitals monitoring, indoor navigation, and data interoperability from traditional equipment are all expected to benefit from IoMT. The Indian mobile healthcare market was worth INR 39.83 billion in 2018 and is expected to reach INR 197.14 billion by 2024, growing at a CAGR of 31.07 percent between 2019 and 2024 (Gupta,2022)[57]. The acceptability of mobile healthcare in the country has been aided by lower costs, increased patient interaction, and data accuracy. The market is fragmented, with rising start-ups and different global firms establishing their influence in India. **Mobile entertainment, auction and other services:** With low-cost smartphones and affordable internet, Video-on-Demand (VoD) and Over-the-Top (OTT) media services are excellent for consuming localised content across many devices. While telecommuting, zoom conference calls and physical distance are now commonplace, long workdays and erratic work-life balances still prevail. The increased commuting time and current lockdown due to the global pandemic COVID-19 are providing an escape route for Uber drivers and working professionals living and struggling in urban centres. Mobile, convenient, and affordable entertainment screens offer a wide range of content options. Showing vernacular content looks to be the natural solution to match these new, rising segments' demands. The internet and smartphones are the lifeblood of the VoD sector. The Internet and Mobile Association of India projects a rise in Internet users from 481 million in 2012 to 762 million in 2022. According to an ASSOCHAM-PWC report, India's smartphone market would reach to 859 million users by 2022 (business standard,2009)[58]. Data from GSMA Intelligence shows that there were 1.14 billion cellular mobile connections in India at the start of 2022. According to GSMA Intelligence, mobile connections in India accounted for 81.3 percent of the entire population in January 2022. (Simon Kemp,2022)[59]. In January 2022, India had 658.0 million internet users, putting the country's internet penetration rate at 47.0 percent of the entire population (Simon Kemp,2022)[59].

OTT platforms are tailoring subscription plans based on user income and device choices. According to Analysys Mason, Indian smartphone users download an average of 8.5 GB of data every month, equivalent to almost 40 hours of video. According to a Boston Consulting Report, smartphone usage and viewing increased 11 percent annually. Smaller displays (smartphones, tablets, and laptops) now account for half of all TV and video viewing, up 85% since 2010. Unsurprisingly, most users choose smartphones to watch VoD material. Watching entertainment on VoD is an individual experience rather than a group one. Consumers' changing habits and interests are forcing adjustments in OTT service models. Netflix India launched a 'Netflix Mobile-only Plan' for Rs 199 (about $3) to capitalise on the increased smartphone and internet usage. This cheaper mobile-only subscription drew a larger audience to the site, resulting in greater revenue growth than planned (Priyal Pandey,2020)[60]. Cell phones can also be used to conduct auctions. For example, eBay, India's leading online marketplace and trading platform, provides 100 percent reliable and secure auctioning-bidding services, with the USP buying and selling items. Auctions begin at Re.1.m.ebay.com, and the mobile app assists consumers round the clock with information about bidding, buying, and browsing items such as Consumer Electronics, Digital Cameras, Jewellery, Watches, Mobile Phones, and apparel while on the go. m-Commerce can also aid with intra-office communication. Salespeople who are always on the go may require access to the company's information system to check product prices. However, mobile technology allows travelling salespeople to keep track of inventory and communicate with elders. Travelling salespeople do not have to wait long for high management approval. With mobile devices, any information may be transferred effortlessly and rapidly. It eliminates communication obstacles within the office.

2.7 : MOBILE COMMERCE VALUE CHAIN:

A value chain is "a set of activities that a firm operating in a specific industry performs to deliver a valuable product (good and/or service) for the market" (Porter,1985)[61]. According to Barnes (2002), the basic model consists of six core processes in two main areas: (a) content, and (b) infrastructure and services: **Content** involves **Content creation** (creating digital material such as audio, video and textual information), **Content packaging** (digitizing, formatting, editing, customizing, and the use of software to combine and package content) and **Market making (**Marketing and selling content which includes program development, service delivery, and customer care) (Barnes, 2002)[5].**Infrastructure and services** include Mobile **transport** (basic network involved in communications, including transportation, transmission and switching for voice and data), **Mobile services and delivery support** (the infrastructure in connecting to the internet, security, the server platform, and payment systems) and **Mobile interface and applications** (centres on integrating the infrastructure and systems with user's hardware, software, and communications), which includes the user interface, navigation, and application/middleware development, as well as the authoring tools (Barnes, 2002)[5].

Figure Number 2.4:
m-Commerce Value Chain



Source: Barnes (2002)[5].

Like any product or service, m-Commerce involves a number of players in a chain of value-adding activities that terminates with the customer. The important members in the value chain are given in figure number 2.5.

Figure Number 2.5:
Important Members in the m-Commerce Value Chain

Members	The role of members
Mobile network operators	To Provide mobile communication networks.
Service providers	To aggregate, integrate, re-packaging or distributing products or services related to consumers, such as news, games, and financial messages
Content providers	To provide, design or producing various kinds of products or services necessary to all kinds of consumers
Application providers	To convert all kinds of Internet-based applications into the wireless environment, and develop application software to enrich the compass and content of mobile applications
Infrastructure and mobile equipment vendors	To design and manufacture communication network as well as mobile handset or other equipment that support WAP, GPRS, 3G, Wi-Fi or other communication technologies.
Middleware provider	To provide pre-built components, including wireless middleware and application middleware to consumers or enterprise
Mobile equipment retailers	To sell all kinds of mobile equipments or retailing-related products to consumers
Customer	End-users, including general consumers or enterprise users

Source: Wang and Lu (2008)[62].

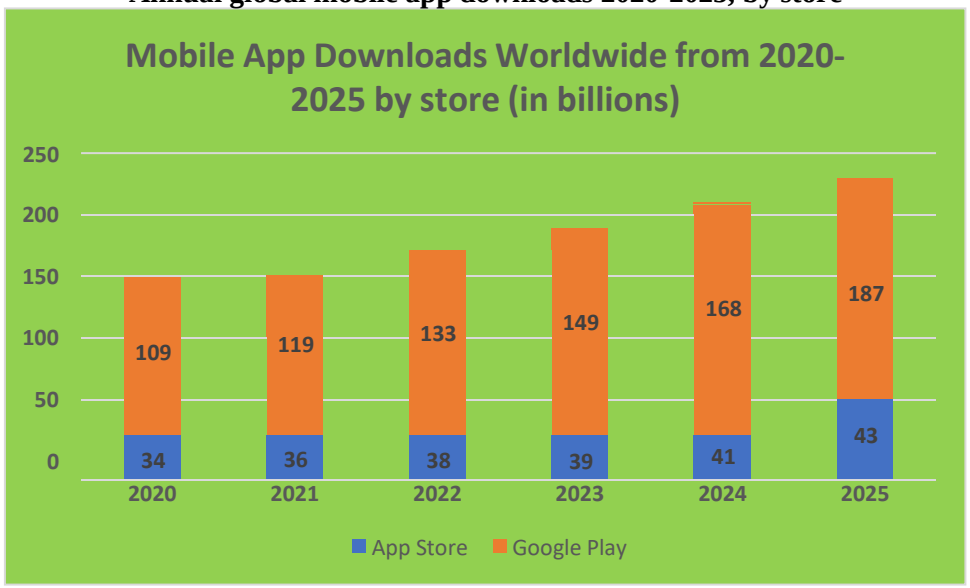
m-Commerce services are not limited to the urban rich population, it has played an important role in the lives of the people in rural areas too. During the 2004 Tsunami, the fishermen of the Chinnakudi village, Tamilnadu, had a tool that informed them of the weather forecast, wind speeds, wavelength, and wind direction.

More than 85% of Indians use their phones for shopping and price comparison, making it the third-most-popular topic, with e-mail being the first, followed by social networking sites. Ngpay, one of the largest m-malls, has over 100 merchants and more than 1.5 million users, with a daily footfall of 40,000. Customers with a basic mobile handset can use Ngpay to pay bills, buy tickets, shop, recharge, or bank, one of the many examples of the sheer popularity of m-Commerce services.

2.8 MOBILE APPS: BOOST TO M-COMMERCE:

According to Neilsen, mobile users spend an average of 30 hours per month on mobile applications. Most business organizations have developed and deployed apps of their own, which they use to increase sales, inform customers about deals, and improve the customer-business relationship by providing quality service options. Apps are a step above mobile websites, with their sleek optimized designs, faster, efficient content navigation, and features like quick single-click payment options, image search, voice recognition, barcode scanners, etc. Such apps' user-friendly and efficient nature increases customer satisfaction, leading to impulse purchases.

Graph Number 2.4:
Annual global mobile app downloads 2020-2025, by store



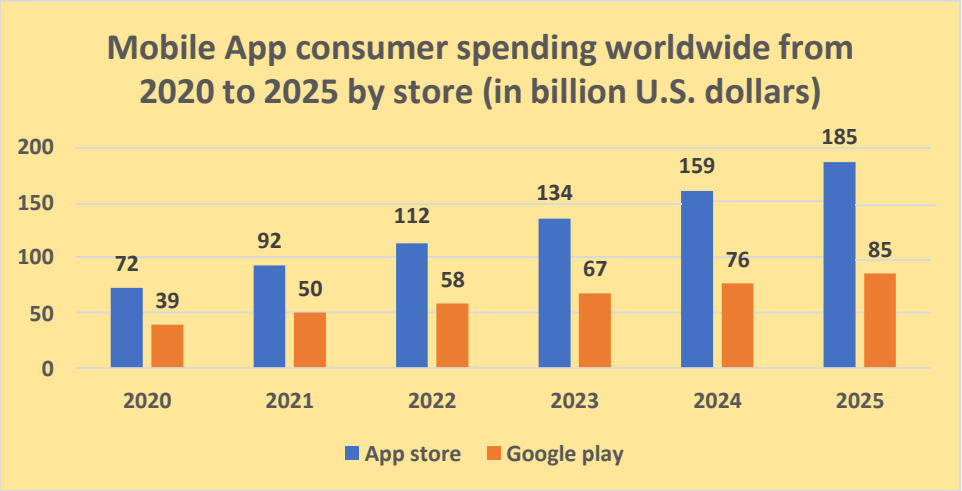
Source: Ceci (2022a)[63].

From 2020 to 2025, this graph shows the number of mobile app downloads worldwide, sorted by the app store. One hundred eighty-seven billion mobile apps are expected to be downloaded from the Google Play Store in 2025, up from 109 billion in 2020 (Ceci,2022)[63].

Messaging apps have become extremely popular in the country and serve as marketing channels. These apps provide accurate, personalized data and better customer interaction, with most people preferring messaging apps to contact brands rather than using e-mails or phone calls, according to eMarketer. Apps like Lenskart, Hunter, etc., utilize AR technology to provide an interactive and immersive environment for the customers to test their products.

Forty percent of the consumers are likely to spend more on purchases if they experience the product using AR, according to a report by Retail Perceptions. Apps utilizing image processing technology allow customers to search for products by just taking a photo using their cameras. Machine learning (ML) is increasingly used to process user data to learn usage patterns, predict consumer behaviour and build a more streamlined experience tailored to each customer's preferences. Mobile applications are faster and more efficient than mobile web pages. According to Google, websites that take more than three seconds to load are abandoned by more than 50 percent of the consumers. Mobile applications are also safer. Thus, most financial transactions are carried out through apps rather than mobile internet. According to a report by ComScore, more than 85 percent of the time spent on mobile phones is on apps. However, the top five apps make up more than 80 percent of total usage time, despite the huge popularity of various apps. Apps tend to collect many users' information: their location, transaction details, debit card information, time and pattern of usage, etc. According to a report by Mindtree conducted in 2017, consumers prefer retailers that can provide a more personalized experience while making purchases. It also underlined a variety of consumer preferences regarding retail technology, with retailers implementing robotics and automated shopping algorithms expected to perform better. Near Field Communication (NFC) technology used for payments is considered one of the most reliable methods today. One just needs to wave the mobile phone that has been set up connectivity securely with the bank account or card in front of the receiver to carry out the payment. With all this technology in place, these apps pose substantial security risks. Many apps now ask permission for our contacts, location, and other system features, and the potential security breaches from mobile apps are a major concern today.

Graph Number 2.5:
Annual global mobile app consumer spending 2020-2025, by store



Source: Ceci (2022b)[64].

The Google Play Store is expected to generate 85 billion dollars in revenue from mobile app purchases by 2025. Almost 270 billion dollars will be spent on the App Store and Google Play by 2025 (Ceci,2022b)[64].

2.9 ESSENTIAL FEATURES OF AN M-COMMERCE MOBILE APP:

Speed: This crucial feature gives it a big edge over a mobile website. In the fast-paced world that we live in today, slow services are immediately rejected. Every element in an app has to be highly optimized, ranging from the photos and the pages to even the scroll speeds. **Analytics:** By measuring and analyzing user behaviour and data (such as location changes, product and time preferences, etc.), app designers can make changes to provide a more personalized experience for the consumer. The analytics also help the users be aware and keep track of their activity and make decisions accordingly by elevating the user experience. Analytics help improves customer loyalty and retention. **Integration of social media: -** The option to log in using social media is a quick, hassle-free method of registration while receiving information about the customer. Integrating the app with social media plugins allows users to share products onto their own social media pages, effectively letting the customer advertise your products and drastically improving the marketing reach of your retention. **Integration of user experience** – Users now prefer minimalism and simplicity. A clutter-free environment is crucial for most services and is not just limited to m-Commerce. The optimal app should be highly intuitive to navigate and should only contain important information. **Advanced search option** – With lots of m-Commerce apps providing thousands of products and customers with diverse requirements, an advanced search option is a must for m-Commerce applications. Consumers spend minimal time searching for products that meet their specific requirements. Search options with robust filters can help consumers zero in on the products they need. Extensions like image search options utilizing image processing and artificial intelligence technology let users search for products by just uploading a picture. **Push notifications** - push notification is one of the most effective methods of marketing your products. Push notifications are used to inform the user about discounts, offers, new arrivals and other features (cedcommerce, 2020)[65].

2.10 MOBILE COMMERCE ADOPTION:

According to Rogers, the innovation diffusion process is "the dissemination of a new concept from its source of invention or production to its eventual users or adopters" (Rogers, 1983[66]; cited by Kotler et al., 2003)[67]. Early adopters are opinion leaders who recognize the potential value of technology and will use it when the benefits meet their wants and aspirations. They get information via broadcast channels, and innovators and early adopters learn about innovations and products and make decisions based on that information (Kotler et al., 2003)[67].

2.11 DRIVERS OF M-COMMERCE ADOPTION:

According to Philip Kotler, "adoption" is "an individual's decision to become a regular consumer of a product or service" (Kotler et al., 2003)[67]. Early adopters are thought leaders who recognize the new technology's potential and can decide its implementation and offerings.

Technology availability, increased disposable income, increased awareness and desire for digital content, 4G network availability, decreased transaction and other service costs due to automation, and a shift in focus toward brand loyalty are all factors promoting m-Commerce acceptance (Little, 2001)[68].

Research on m-Commerce adoption has been conducted utilising the Technology Acceptance Model hypothesis (TAM). According to studies, "perceived usefulness," "perceived utility," security and confidentiality, customer service, lower prices, independence of time and place, "non-intrusive personalization," graphics and ease of use, lack of a long physical queue, and location-based services are all factors that positively influence m-Commerce adoption among consumers (Yang, 2005[9]; Pousttchi and Wiedemann,2006[69]; Vrechopoulos et al., 2002[70]).The negative characteristics include perceived risks, ads that are considered "irritating," perceived payment method complexity, and absence of extensive merchant acceptance (Mallat,2007[71]; Tsang et al., 2004[72]).According to a study by Jelassi and Enders (2004)[73], mobile advertising campaigns using Short Message Services (SMS) can achieve response rates of up to 40 percent, compared to a response rate of 3 percent for direct mail and 1 percent for online banner ads. In a cross-country study conducted in Finland, Germany, and Greece, Vrechopoukis et al. (2002)[74] discovered that ease of use interface, security, customer service knowledge, price, and device comfort influenced consumer acceptance of m-Commerce. According to a study by Heinonen Kristina and Strandvik (2003)[76], mobile communications are more personal than traditional e-mail channels. Tsang et al. (2004)[72] discovered that respondents have a negative opinion regarding getting SMS advertisements without consent because they find it annoying. Permission, on the other hand, does not guarantee that the consumer will pay attention; it is merely a door opener that indicates the consumer's prospective interest regions (Tripathi and Siddiqui, 2010)[77]. Some essential drivers of m-Commerce are its time independence and location-based services. The services are tailored to the individual's usage patterns and preferences. The brand image is much boosted, and consumers are more loyal when services are available at the touch of a finger. Flexibility is essential in an ever-changing, fast-paced lifestyle, and m-Commerce, with its mobility and ubiquity, provides the ideal solution for such customers (Tiwari and Buse, 2007)[17].

2.12 : BENEFITS OF MOBILE COMMERCE:

m-Commerce, though initially limited to basic transactions and bill payments, has now diversified to include many services. The benefits that led to the boom are: - **Better customer experience: -** m-Commerce is a highly competitive field where companies aim to attract and retains more customers. m-Commerce has made browsing and shopping extremely simple, where one just needs a phone with an internet connection to order products. This paired with personalized recommendations, sleek and fast apps, a variety of discount offers, automated customer service, 24/7 location independent service and implementation of technology like augmented reality for an immersive experience significantly elevates the user experience.

Wide reach: - with mobile apps, every single person with a mobile phone is a potential customer. The massive user base allows the retailers to expand and increase their sales rapidly. With proper servers, the service is also "crowd independent" as there is no queue, and the consumer needs to download the app to avail of all the offers and services. **A range of payment options:** - Mobile apps now offer a diverse array of payment options. Users can pay with cash, credit/debit card, UPI, or mobile wallets. The introduction of mobile wallets has made one-touch payments possible, and even for card payments, customers are not required to enter all the details. **Localization:** - mobile apps use geo-tracking to ascertain the user's current location and travel pattern. This allows the apps to give highly personalized services specific to the location. **Time-efficient processes:** - Mobile applications are highly optimized and designed to be fasters than websites. This makes shopping on the phone highly time-efficient and quick, making it a better choice over desktops in the current fast-paced lifestyle. **On-screen push notifications: -**On-screen push notifications are one of the most effective forms of advertisements. You can advertise products and services to every single consumer directly, and the popup notification on the screen makes it hard to ignore, which increases customer engagement, awareness and loyalty. M-Commerce is a very effective marketing channel, potentially reaching millions of customers directly, with personalized ads, cost-efficiently. Applications can send a push notification when the customer is browsing for some particular products, drastically increasing the probability of the customer accessing the app. **Productivity and reduced costs:** - Deploying services online through phones is much cheaper than building physical stores and is not limited by location and time restrictions for the customers. Communicating with the customers is also more affordable with the use of messaging apps and SMS services. Many apps also have social media extensions, making customers a part of spreading the words themselves. **Customer data: -** people carry their phones everywhere, and most of their activities involve mobile phones. Apps can record customer activity and collect information about the travel patterns, products that the customer needs, the time of peak mobile activity, and other habits and preferences. This data is extremely valuable for companies that strive to make highly efficient and personalized offers to increase sales.

2.13 BARRIERS OF M-COMMERCE ADOPTION:

The primary issue plaguing m-Commerce is security. With the automation of most services, mobile phones contain a lot of sensitive data, from personal photos to credit card information. The common security issues include manipulation of data, unauthorized access of data, online theft, identity fraud, spam etc. Consumers are paranoid about viruses and malwares which might lead to data theft. Most apps ask for system permissions during installation and there are plenty of fake apps online that take advantage of this to steal data and scam people. This concern is compounded by slow internet connections, where there is a risk of transactions not going through. Apps track the location, purchase activity, browsing activities, and other habits and preferences, which creates an ethical issue about breach of privacy. Aggressive advertising by various companies leads to congestion, too many notifications and ever-filling spam e-mails.

Using m-Commerce services requires some skill with technology, and the task can be quite daunting for new users. Though useful, the different payment options, customization, optimization, and personalization options can be overwhelming, and there is no straight guide for consumers to refer to (Fenech, 2002). Services need some form of AI guide or a system to teach users all the important features in a particular app or service, making it easier for newer users (Bai et al.,2005)[36]. The final m-Commerce product results from the combined effort of multiple parties: internet providers, application developers, operating system providers, mobile OS developers, wireless infrastructure providers and phone manufacturers. Any form of discord or cooperation between parties causes issues in the m-Commerce value chain. Expensive investment requirements for infrastructure maintenance and upgrades, spectrum management, and changes in government policies and regulations are the main barriers faced by telecom companies. The environmental concerns due to e-waste and the health hazards from very high screen time and unhealthy radiation exposure are barriers against m-Commerce adoption. According to a survey conducted by Quikr Bazaar, 40 percent of the consumers replace their mobile phones in less than a year, resulting in mobile phones being a majority of the 5 million tonnes of electronic waste (e-waste) generated in India.

2.14 M-COMMERCE TRENDS:

More than half of the online sales in India are carried out using mobile phones. This can be attributed to the various trends in m-Commerce that have bolstered its dominance in the Indian market. **Augmented Reality:** m-Commerce lacks one main thing compared to traditional mall shopping Reality technology; "seeing" the product as a whole, whether it be trying out shoes, makeup or sunglasses. Augmented Reality (AR) is often applied to solve this. AR involves "superimposing general computer images to user's view of the real world", providing an interactive, immersive experience. With AR integration, customers can "check" how a table will fit in the room, see how they will look in a new outfit or see how their room looks with a new coat of paint. Lenskart, one of the companies to integrate AR early, lets customers test out glasses by "wearing" them in augmented reality (Mroczkowska,2020)[79]. **Voice features**: Mobile phones have small screens with smaller keyboards, making it uncomfortable to type for many people who prefer laptops or desktops. Voice recognition has proven helpful with assistants like Siri and Alexa, and the application-specific to m-Commerce is inevitable. With voice control and search features, customers can now browse for products, filter, select styles, and even place orders using their voice, making the m-Commerce experience more seamless and comfortable. **Social Commerce:** There is a huge increase in users using social media to search, buy and sell products and services. Many apps have integrated social media sharing, with which consumers can share links to products they have tried and recommended, drastically increasing the businesses' reach and letting the consumers advertise the products. Social media platforms are now setting up mobile commerce experiences of their own. In May 2020, Facebook launched "Facebook Shops", which lets businesses make free online stores on Instagram and Facebook. Customers can use messaging apps like Messenger and WhatsApp to contact businesses regarding their queries.

Chatbots: Chatbots are a huge part of the user experience. Many businesses have integrated a customer service chatbot into their website, but these mostly have predetermined questions and answers. Chatbots have much more potential; with machine learning and artificial intelligence, chatbots can be sophisticated. Bots can learn in real-time and hold a conversation with the customers, which elevates the user experience as it is like having a second person to talk to while shopping. With chatbots, the business employees don't have to address every query, and the users can ask any relevant questions while having a personalized conversation rather than scouring through the FAQ section. Eighty-five percent of all customer interactions are automated without human involvement, and chatbots are crucial to this statistic. Chatbots who can talk just like friends that brands like Nike have developed are especially effective with millennials, who spend about 6 hours per week on m-Commerce apps. Mahindra has implemented many AI-powered chatbots and voice assistants in multiple instances. Club Mahindra's AI Tripper assists customers in their transactions and booking their holidays. A personal voice assistant to assist in driving and answering questions regarding the vehicles in different languages has been launched by Mahindra's automotive team. Similarly, My Agri Guru (MAG) is a tool designed to attend to any queries farmers might have. Mahindra is also developing AI chatbots to assist with investment procedures, fully integrated with a payment method (Caley,2017)[80].

Omnichannel experience: A variety of devices on the market and business mostly apply a multichannel model, with a different experience for each channel. The next step is to create an omnichannel experience, which ensures that the consumer has the same experience in all the different channels, making transitions seamless and the shopping experience cohesive. Companies like Disney, Virgin Atlantic, Pepperfry andStarbucks have mastered the omnichannel experience. For example, the Starbucks rewards app gives you rewards for every purchase. The system is seamless; customers can reload or check their card wherever and whenever they want; either on their phones, desktops, in the store, or on the websites. The changes are updated in real-time across all the channels (Roizen, n.d.).[81]

Crypto payments: Cryptocurrency is a virtual currency where data of ownerships are stored in digital ledgers using cryptography, making it nearly impossible to counterfeit. Brands will start integrating cryptocurrencies and blockchain technology in the coming years thanks to its speed, security, lower transaction costs, and immunity from government interference (Investopedia,2022)[82].

2.15 CONCLUSION

UN estimates put India's economy at 6.4 percent growth in 2022, making it the world's largest (Indiantoday,2022)[83]. With the declining inflation rate and a revitalized rural market brought on by a good southwest monsoon and fresh planting, the RBI has also promised that India's economy will grow faster than others, raising hopes that rural customers will soon have the same purchasing power as urban ones (Reuters, 2022)[84]. India's GDP is expected to expand by 6% in the fiscal year 2023. Online shopping, particularly for mobile devices, has a lot of potential due to the rising spending power of Indian customers and the shift in purchasing behaviour brought on by the global pandemic.

Even though the trend toward online shopping, particularly through mobile devices, began before the COVID pandemic and accounted for about 25% of online retail sales, the pandemic has increased the adoption rate by 40% to 60% and it now includes all types of goods, from clothing and electronics to daily necessities like food and toiletries. As a result of their familiarity with online shopping, at least 50% of customers will continue to shop online, and according to Mckinsey's predictions, online sales will make up 50% of all retail revenues by 2024, the changes in their purchasing habits during the pandemic will last for a longer period. (McKinsey,2021)[85]. App Annie just released a report stating that India has become the second-largest app downloading market in the world in 2021. A 28 percent annual increase in app downloads was seen in 2020, when Indians installed 24 billion apps. More people downloaded games and social apps than any other app category. Facebook, WhatsApp Messenger, and YouTube were the most popular apps. As the app industry grows, so does the number of people using it. Customers in India began spending more than four hours a day using apps in 2020 (Indiantoday,2022)[83], this amounts to 651 billion hours throughout the course of the year. In the third quarter of 2021, Indians spent an average of 4.6 hours daily. According to a recent survey, India has some of the most mobile-first clients in the world at the moment. It is also the largest market for mobile gaming in the world in terms of downloads across iOS and Android Play.

"In the first half of 2021, Indian gamers downloaded 4.8 billion games. Nearly one-fifth of the game downloads were made in India", According to the App Annie (the Hindu business line, 2021)[86]. The expansion of the Unified Payments Interface (UPI) payment method has resulted in an increase in the downloads of specific merchant utility apps. During the second quarter of 2021, merchant utility app downloads increased by 48% year over year to over 124 million, while UPI transactions more than doubled in a single year to nearly 8 billion. An estimated 14 million Indians use 'Khata Book' each month, making it one of India's most popular applications in Q2 2021."A parallel opportunity offered by the UPI-led digitalization of payments has been in 'buy now pay later' and credit apps," the paper said further down. Products like StashFin, Dhani, Kissht, and Slice Super Card make it easy for users to get credit virtually quickly after submitting an application. According to these estimates, the travel and navigation app market is poised for considerable growth beginning in 2021 (Hindu business line, 2021)[86]. A third of Indians' waking hours, or around 4 hours and 42 minutes every day, will be spent on their mobile devices by 2021. Mobile is clearly where the action—and the audience—are when compared to the typical daily watching time of 3 hours and 17 minutes for televisions. Consumer trust is paramount for any business or service to expand and prosper. Consumers are always looking for safe, mobile, comfortable to procure, ubiquitous and cost-efficient services. M-Commerce ticks most of these requirements. M-Commerce services are ubiquitous, accessible, convenient, personalized and largely independent of time and place. M-Commerce has turned mobile phones into a multi-faceted tool deeply embedded in our lifestyles. Despite these advantages, barriers impede the adoption of m-Commerce among the general public, the biggest issue being security. More stringent consumer protection laws and a robust system to address grievances will build trust and attract users.

Customers are key to the expansion and growth of any technology. For businesses to increase profits and improve customer retention through m-Commerce, it is crucial to understand the dynamics and factors that influence its acceptance and adoption. A number of studies have been carried out trying to uncover the dynamics involved in m-Commerce, the majority of them using the TAM model and the DOI theory, but these have not succeeded in giving a comprehensive explanation (Pedersen et al., 2002[87]; Lu et al., 2003[88]; Nysveen et al., 2005[89]). There is no doubt that all business activities will have an element of m-Commerce in the coming days. Companies going the m-Commerce way need to have a strategic business plan to create a road map to choose strategic partners and identify critical customer touchpoints by providing a conducive environment to assimilate the larger part of the society by developing user-friendly apps and instilling trust in customers to adopt m-Commerce as a way of life.

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