Future of Smart Shopping: Using Cryptocurrencies

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ABSTRACT

The future of this world, the technology which is going to be built will evolve around ideas which will make the world a better place for us humans and for the generations coming to accept the basics of the nature and enhance our relationship to this world. Online (eCommerce) and offline retail are becoming less and less distinct (Bauer & Garaus, 2018). However, one benefit of eCommerce is that it allows for a quicker transaction because many buyers publish reviews on websites like amazon.com or ebay.com for the majority of the items.

In this study, we have aimed to expand the world of AI and data recognition. The way retail establishments work is changing as a result of artificial intelligence (AI). In my vision, the future of physical retail will be AI-Powered Automated Stores. Consumers at these retail establishments deal with totally automated technologies. As a result, it's crucial to carefully consider the factors that led to consumers' decision to visit AI-Powered Automated Retail Stores. This study explores this field in an effort to identify the factors that indicate consumers' inclination to visit AI-Powered Automated Retail Stores. Using the help of artificial intelligence, we can improve in much higher pace. One of the greatest major that AI is playing a significant role is ecommerce and digital marketing (Berman, 2019). The article's goal is to examine various technologies that may be used to enhance customers' indoor shopping experiences. As a result, we want to investigate several strategies that, when combined with consumer sentiment analysis, can shorten the time customers take to pay for goods and personalize their shopping experience. Also, it will be explaining the potential of integrating AI and blockchain and providing the world with a better technology and more secure and

trustable fields to operate upon. Blockchain will ensure the security of every network and optimize each transaction to its maximum and reduce every possible obstacle and wastes in its path (Bauer & Garaus, 2018). Based on the experiences of companies that accept cryptocurrency payments, this study will also seek to identify the process and affective metrics in adopting cryptocurrencies for purchasing. Consumers and retailers prefer cryptocurrencies since they are a quick, secure, and affordable form of international payment. However, it has been shown that some consumers are completely ignorant of the possibility of making purchases using cryptocurrency. Some consumers prefer not to utilize cryptocurrency as payment, either due to limited technology utilization or a lack of faith in the system (Liljander, Gillberg, Gummerus, & Riel, 2006).

Keywords: AI, blockchain, technology integration, digital marketing, e commerce, security, neuroscience, utilizing cryptocurrencies as a form of payment.

ÖZ

Bu dünyanın geleceği, dünyayı biz insanlar ve gelecek nesiller için doğanın temelleri olarak kabul edecek ve bu dünyayla ilişkimizi geliştirerek daha iyi bir yer haline getirecek fikirler etrafında, inşa edilecek teknolojiler ile gelişecektir. Çevrimiçi ve çevrimdışı ticaret (e-ticaret) giderek daha az belirgin hale geliyor (Bauer & Garaus, 2018). Ancak, e-Ticaret'in bir avantajı, birçok alıcı, öğelerin çoğu için amazon.com veya ebay.com gibi web sitelerinde incelemeler yayınladığı için daha hızlı bir işleme izin vermesidir.

Bu çalışmada yapay zeka ve veri tanıma dünyasını genişletmeyi hedefledik. Perakende kuruluşlarının çalışma şekli, yapay zekanın (AI) bir sonucu olarak değişiyor. Benim vizyonuma göre, fiziksel perakende ticaretinin geleceği, Yapay Zeka Destekli Otomatik Mağazalar olacak. Bu perakende kuruluşlarındaki tüketiciler, tamamen otomatikleştirilmiş teknolojilerle uğraşırlar. Sonuç olarak, tüketicilerin AI Destekli Otomatik Perakende Mağazaları ziyaret etme kararına yol açan faktörleri dikkatlice değerlendirmek ve düşünmek çok önemlidir. Bu çalışma, tüketicilerin AI Destekli Otomatik Perakende Mağazaları ziyaret etme eğilimini gösteren faktörleri belirlemek amacıyla bu alanı incelemektedir. Yapay zekanın yardımıyla çok daha yüksek hızda gelişebiliriz. Yapay zekanın önemli bir rol oynadığı en büyük alanlardan biri e-ticaret ve dijital pazarlamadır (Berman, 2019). Makalenin amacı, müşterilerin iç mekan alışveriş deneyimlerini geliştirmek için kullanılabilecek çeşitli teknolojileri incelemektir. Sonuç olarak, tüketici duyarlılığı analizi ile birleştirildiğinde, müşterilerin ürünler için ödeme yapma süresini kısaltabilecek ve alışveriş deneyimlerini kişiselleştirebilecek birkaç stratejiyi araştırmak istiyoruz. Ayrıca, AI ve

blok zinciri entegre etme potansiyelini açıklayacak ve dünyaya daha iyi bir teknoloji ve üzerinde çalışılacak daha güvenli ve güvenilir alanlar sunacak. Blockchain, her ağın güvenliğini sağlayacak ve her işlemi maksimum düzeyde optimize edecek ve yolundaki olası her engeli ve israfı azaltacaktır (Bauer & Garaus, 2018). Kripto para ödemelerini kabul eden şirketlerin deneyimlerine dayanarak, bu çalışma aynı zamanda satın alma için kripto para birimlerini benimsemenin faydalarını ve dezavantajlarını belirlemeye çalışacaktır. Tüketiciler ve perakendeciler, hızlı, güvenli ve uygun maliyetli bir uluslararası ödeme şekli oldukları için kripto para birimlerini tercih ediyor. Bununla birlikte, bazı tüketicilerin kripto para birimi kullanarak alışveriş yapma olasılığı konusunda tamamen bilgisiz oldukları gösterilmiştir. Bazı tüketiciler, sınırlı teknoloji kullanımı veya sisteme olan inanç eksikliği nedeniyle ödeme olarak kripto para birimini kullanmamayı tercih etmektedir (Liljander, Gillberg, Gummerus ve Riel, 2006).

Anahtar Kelimeler: yapay zeka, blok zincir, teknoloji entegrasyonu, dijital pazarlama, E ticaret, güvenlik, sinirbilim, ödeme şekli olarak kripto para kullanımı.

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Chapter 1

INTRODUCTION

1.1 Background

The earliest trace of artificial intelligence was during 1950s. A generation of scientists, mathematicians and philosophers, the idea of artificial intelligence (AI) was being developed in their mind. Different ideas and models were proposed. A British polymath named Alan Turing found a pathway to give life to the idea of making machines learn by themselves, judge by their judgments and asses by their assessments (Bauer & Garaus, 2018). He explained, humans are learning and making decisions based on available information. Therefore, if robots are trained with enough data, they might have equal power of logic and thinking. If we can design and create algorithms which can absorb information a way to be make an efficient data extraction and learn, basically we can make machines learn anything since this is the same concept of humans learning process (Pilla, Sivathanu, & K.Dwivedi, 2020).

Given its disruptive nature and recent quick breakthroughs, artificial intelligence (AI) has given the industry's digital transformation pace. (Pilla, Sivathanu, & K.Dwivedi, 2020) According to Nilsson (Jonker N. , 2019) "intelligence is that property that allows an entity to function effectively and with foresight in its environment, and artificial intelligence is that effort committed to making computers intelligent" (V.Hausman & SamSiekpe, 2009). Although artificial intelligence (AI) has been present since the 1950s, it has recently grown in popularity because it adds value to businesses by

assisting merchants in foreseeing future demand and assisting in the advertising and delivery of goods and services to customers. (Inman & Nikolova, 2017)

The physical and online retailing spaces are transforming as a result of AI-based technologies and techniques such robots, chatbots, bots, augmented reality, virtual reality, machine learning, deep learning, computer vision, cognitive dialogue commerce, and the internet of things. In order to create fully automated self-service retail stores that offer customers one-click checkout, automated explaining, marketing, selling, and payments as well as customized product alerts and information, product delivery, and customer education, these stores are known as AI-Powered Automated Retail Stores (AIPARS) (Gursoy & Chi, 2019). The "smart" technological breakthroughs, socioeconomic changes, and altered consumer buying habits in the retail sector are all shown in AIPARS, which is driven by the rapid growth of linked technologies, communication, and information (Berman, 2019).

AIPARS are made to save labor costs and boost sales at the business. Consumer behavior in the retail industry is influenced by innovative technology in stores. Innovative technologies are being used by customers in retail settings, thus it's important to understand how they feel about it because it influences their propensity to buy (Inman & Nikolova, 2017). Studying the behavioral consumer's intention to buy at these shops is crucial. Understanding consumer behavior with relation to shopping at AIPARS will be useful for store managers so they can create appropriate strategies for the easy adoption of shopping by consumers at AIPARS.

The pace of AI is increasing exponentially which means that as we proceed the computers and the intelligence of them will be much stronger day by day. One of the

topics which is integrated with AI is data science in computer science. (Lewis, 2014) Data science is one of the main foundations that AI is also progressing upon. Today the explosion of digital data and the speed of digital communication infrastructure is allowing us to even take AI to further place. In a unique perspective we can understand that the commercialization error of artificial intelligence has just begun. Therefore, we are expecting more investments and more paces increase in the development of AI as we proceed through time. The same scenario with internet blockchain and their newly built technology which is expanding the world of communication and network (Kim & Lee, 2016).

1.2 Virtual Money as Payment

Money, a vital instrument throughout human history, has just begun to change into cryptocurrencies, which can be stored, exchanged, and used to make purchases in the digital world. At the end of the 1980s in the Netherlands, truck and trailer drivers were able to purchase gasoline using smart cards loaded with money to protect them from crimes like theft and extortion while they were resting in gas stations. This was the first fundamental application of digital money (Schuh & Shy, 2016). Following the 2008 real estate crisis in the US, the markets for cryptocurrencies opened up. As a coin that is not produced by any central bank, government, or organization and is safeguarded by cryptographic protocols, Bitcoin, the virtual currency system developed by Satoshi Nakamoto in 2008, drew interest as a viable option for online buying (Temizkhan, Yetgin, & Yilmaz, 2022). The wallet, blockchain, and miner are the three components that make up the bitcoin program. It is not reliant on the internet, but it may be given to someone else if needed. In this application, the blockchain updates itself every 10 minutes like a bank and distributes information to wallets in the network, and the wallet maintains a copy of the Blockchain. The mining process

protects and executes transactions to avoid double-spending. (Esch & Arli, 2020) It has been determined that the key technology underlying cryptocurrencies is blockchain. (Temizkhan, Yetgin, & Yilmaz, 2022)

Although nations, international organizations, and investors have begun expressing interest in virtual currencies, retail and direct consumer relations have not seen the same level of development. Shops are interested in using cryptocurrency payments soon, but poor customer demand is a key barrier to retailers adopting cryptocurrency (Jonker N. , 2019). However, there is not enough study on the implications of blockchain and virtual currencies for consumers (Temizkhan, Yetgin, & Yilmaz, 2022). According to a 2016 survey, 768 Dutch shops working in various industries had their payment practices, attitudes toward them, and plans regarding online cryptocurrency payments assessed (Jonker N. , 2019). The data show that 13% of all retail commerce is made up of virtual payments. Another survey conducted in Greece found that while 65-70% of participants had unfavorable opinions and a defensive attitude toward virtual money, just 17–20% of individuals utilized Bitcoin as a payment and investing method. According to another Canadian study (Alshamsi, 2019), all age groups were aware of bitcoin, younger groups used it often, and better educated Canadians were more inclined to use it as a payment method. According to studies, 72% of individuals with annual incomes of $100,000 or more are more familiar with Bitcoin than those with modest incomes (Alshamsi, 2019).

The studies (Henry, 2018)' main goal was to investigate consumer behaviors and motivations related to retail virtual money usage decisions. The motivations behind retail sectors adding virtual currency payment alternatives in addition to traditional ones and how the ability to use digital currency when purchasing has an impact on

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customer decision-making have been examined in this study. The issues with Henry's study includes the factors that led retail businesses to switch to the cryptocurrency payment system, the advantages of this system for consumers, the benefits of virtual money payments for retailing, the potential perception of the status of virtual money, and the challenges that retailers and customers encounter when making virtual money payments (Henry, 2018).

Chapter 2

LITERATURE REVIEW

2.1 Theoretical Basis

Advancement of technology and innovations are not always beneficial. Sometimes in fact they create hardship and slow the processes. Other that these factors, another crucial factor is the acceptance of users to trust and be confident that the advancement would not cause distraction (Temizkhan, Yetgin, & Yilmaz, 2022).

In today's technologically advanced corporate world, readiness for and acceptance of technology are crucial study topics. TAM is a popular paradigm for analyzing how technology gets adopted. TR stands for the propensity of a customer to use technology (Pilla, Sivathanu, & K.Dwivedi, 2020) (Temizkhan, Yetgin, & Yilmaz, 2022). In several research the acceptance and readiness of new technologies in the era of online shopping and retailing are measured.

2.1.1 TR

TR (theoretical readiness) is defined as a person's propensity to embrace and use new technologies for achieving goals in their personal and professional lives. A person's tendency to utilize new technology (TR) may be characterized as "an overall state of mind arising from a gestalt of mental facilitators and inhibitors" (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000) (Pilla, Sivathanu, & K.Dwivedi, 2020). The four components of the TR index are as follows: optimism (OMM) and inventiveness (INN)

are factors in favor of technology, while discomfort (DIF) and insecurity (INS) are factors against the favor of technology. These elements are described as follows (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000):

- **OMM**: A positive attitude toward technology and the conviction that it offers individuals more freedom, adaptability, and efficiency in their life

- **INN**: A propensity for becoming a thinking leader and technological pioneer

- **DIF**: A sense of not having control over technology and feeling overwhelmed by it

- **INS**: Distrust of technology, resulting from doubts about its functionality and worries about its possibly negative effects.

Each person has a unique attitude toward technology, which can be either favorable or unfavorable for a technology that coexists (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000).

2.1.2 TAM

TAM (technology acceptance model) is a widely used and respected model in the field of technology adoption research, and it looks at how consumers intend to use technology. A user's perception of the perceived usability perceived usefulness (PFL) and perceived ease of use (PEE) of a new technology affects the user's intention. PEE is for "the degree that a person feels that utilizing a certain system would be free of effort," while PFL stands for "the degree that a person believes that adopting a specific system would enhance his or her work performance." The subjective possibility of a person engaging in a specific activity is known as intention. The adoption of M-

shopping (Chen & Hsu, 2018), Internet-enabled television shopping, E-auctions, online shopping, and technology in a retail store have all been widely studied using the TAM model (Pilla, Sivathanu, & K.Dwivedi, 2020).

2.1.3 TRAM

TRAM (technology readiness and acceptance model) is a combination of TR (theoretical readiness) and TAM (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000). TR refers to the consumers' cognitive propensity to embrace new technologies and analyzes the individual-specific elements influencing this adoption. TR demonstrates how consumers use technology and considers their general beliefs (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000). Consumers with high TR, however, are not necessarily in favor of embracing new technology; in contrast, TAM is system-specific and covers PEE and PFL. As it considers the TR model and TAM model, which supply consumers' cognitive willingness and viewpoint of the new technology (PEE and PFL), TRAM has stronger explanatory power for the adoption of new technologies. Out of the four components that make up TR, OMM and INN are its drivers (Kim & Lee, 2016).

TRAM model has been used to examine the adoption of new technology in areas such as e-service systems, augmented reality in tourism, open banking, mobile services, mobile payments, HIV e-health services, social media, digital services in the B2B health care sector, mobile electronic medical record systems, sports wearables, smart retail technology adoption, mobile device shopping, self-checkout services of retail grocery stores, and self-service (Chen & Hsu, 2018) (Marhefka, 2019). As AIPARS

(AI Powered Retail Stores) is a new retail technology innovation that will undoubtedly aid in the investigation of customer purchasing behavior, this study takes the TRAM model into consideration to analyze the shopping intention at AIPARS.

2.2 Background of AI

Studies on the application of AI in many domains already exist. There are studies on the adoption of AI-based technologies, including those on robots and AI in tourism, intelligent personal assistants, self-driving cars, smart home services, and smart home healthcare systems (Alaiad & Zhou, 2017) (Han & Yang, 2018). Studies have been done on the use of several AI technologies, such as augmented reality and virtual reality, in shopping malls (Han et al., 2018; Mann et al., 2015) There is, however, no study that looks at consumers' intentions to purchase at AIPARS. Modern retail technology is advocated as a crucial tool to decrease customer turnover since it provides customers with an interesting shopping experience (Kim & Lee, 2016).

2.3 Factors Particular to The Context

This research looks experimentally at how consumers are using AIPARS. The research that are currently available on the adoption of AI technology mostly cover the antecedents, such as social capability and device capability, hedonic motivation (Inman & Nikolova, 2017), and trust (Kim & Lee, 2016). Adoption of AI devices employed in service delivery is significantly influenced by performance anticipation, hedonic motivation, and emotions. The research by discusses the characteristics-response speed, interactivity, quality of information, and aesthetic quality-and mentions the variables of virtual reality adoption of online websites. The research that are currently available lack factors that are relevant to AI technology. Consequently, the authors considered the factors unique to AI technology that affect how customers behave when they purchase (Berman, 2019).

2.4 Cryptocurrencies

Cryptocurrency is a type of virtual money that employs encryption, or cryptography, in place of traditional fiat money. Contrary to centralized banking institutions, cryptocurrencies are decentralized assets. A distributed ledger called a blockchain, which serves as the public transaction database for cryptocurrencies, serves as the foundation for this decentralized system (Ciaian & Rajcaniova, 2016). The global economic crisis of 2008 caused a loss of faith in real markets and central financial institutions, which led to the emergence of the current classical payment system's inability to fully meet the wishes and needs of the person (Schuh & Shy, 2016). Satoshi Nakamoto's inventions, including Bitcoin and blockchain technology, were seen as potential alternatives to the existing financial system (Güngör, 2021). Cryptocurrency mining is virtual, much like the cash. It is unrelated to recognized mines, in other words. Because of its scarcity, it is compared to gold and is said to have been found rather than printed. Discoverers are also known as miners. Cryptocurrency cannot provide more or less at will. Every day, a specific quantity is released for discovery, and specialized computers handle this operation. High-end computers and highly skilled workers are also needed, and the first individual to solve the transaction is offered the chance to win cryptocurrency (Güngör, 2021). When they are put up for sale, the process of free usage, purchasing, and selling starts.

Today, more than 6000 cryptocurrencies are known to exist, and some of the most popular ones, including Bitcoin, Ethereum, Ripple, and Litecoin, are traded in more than 60 nations. These cryptocurrencies, which have drawn considerable interest from investors over the past four years, have increased in value as a result of the ongoing epidemic in 2020. Additionally, there are already over 17,000 cryptocurrency ATMs

operating in 68 different nations, and this figure is rising daily (Bitcoin ATM Map, 2021). In order to appeal to millennial consumers and boost sales and marketing efforts, businesses are more likely to accept cryptocurrency payments in addition to more traditional payment options. Some nations and their international organizations' top priorities now center on the rising acceptance and spread rates of digital currencies (Temizkhan, Yetgin, & Yilmaz, 2022).

The innovation-decision process is described by the Diffusion of Innovations Theory as "an information seeking and processing activity in which the individual is driven to minimize ambiguity regarding the advantages and disadvantages of an innovation." The five phases of the innovation-decision process are depicted in the below (Rogers, 2003).
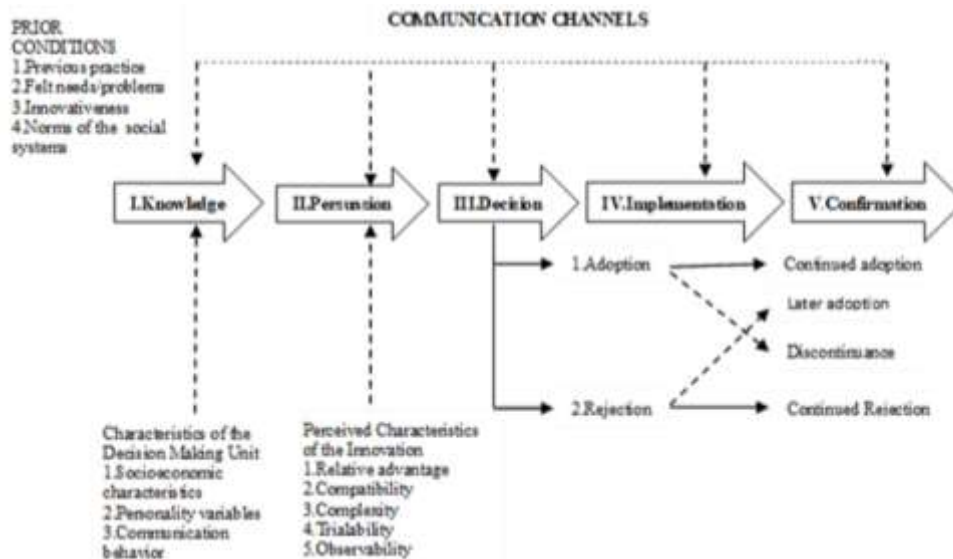

Figure 2: A Model of Five Stages in the Innovation-Decision Process (Rogers, 2003).

The person receives knowledge about innovation and its functions at the beginning of the innovation-decision process. They determine their attitude toward innovation at the persuasion stage by weighing the benefits and drawbacks for themselves. At the

following step, the person decides whether or not to embrace the innovation after learning more facts. At this point, the person is mostly influenced by the opinions of others around them. The choice to accept innovation marks the beginning of the implementation stage. The person reinforces and confirms their adoption decision in the last step.

2.5 AI In Marketing World

In the world of marketing, the concept that we consider, and we have tried to build our environment around it and put AI in use is "predicting the future outcomes based on historical data without human interaction necessarily." (Edwards, 2019) The main concerns and push and pull in the world of AI and marketing is about the predictions which are taking place at every single fraction of time. From stock markets, cryptocurrencies market, Fiat, and Forex markets two software and applications such as Google map, Amazon, Spotify, Instagram, and Facebook and recently Meta.

The main concern in all these applications is to be able to extract valuable information from historical data and make valuable predictions for future interactions (What is cluster analysis , n.d.). The more advanced AI technology grows the more precise prediction it can create. it is important to consider the customers utilization and customizing standards are changing through time. AI must be adaptive to diverse types of selections and ideologies to be effective (AI's coming of age, 2016). Most experts in world of AI believe that this technology is capable for starting a new phase of technology and create more advance lifestyle and lifecycles form humankind (Solanke, 2022). In other words, this is just the beginning of AI.

Additionally, there is an intersection between the world of AI and Marketing (Ma & Sun, 2020). As an example: the world of AI allows user to experience the most suitable ads for them and accessing the product or service at the righteous time and location while considering multiple traits and consider. One the greatest tool in this field is "Facebook ads and Google AdSense "which are running and operating a great percentage of ads in the world now (Ma & Sun, 2020). There are complex artificial intelligence technology working in this platform and using user data as their main foundation for their predictions.

2.6 AI In Commercial Usage

Artificial intelligence and it seems like this vague label for any machine that could think like a human. Fiction writers like to imagine a more generalized AI one that answers any question we might have and do anything a can do. However, that is not the most realistic to think about (Inner Machinations, 2021).
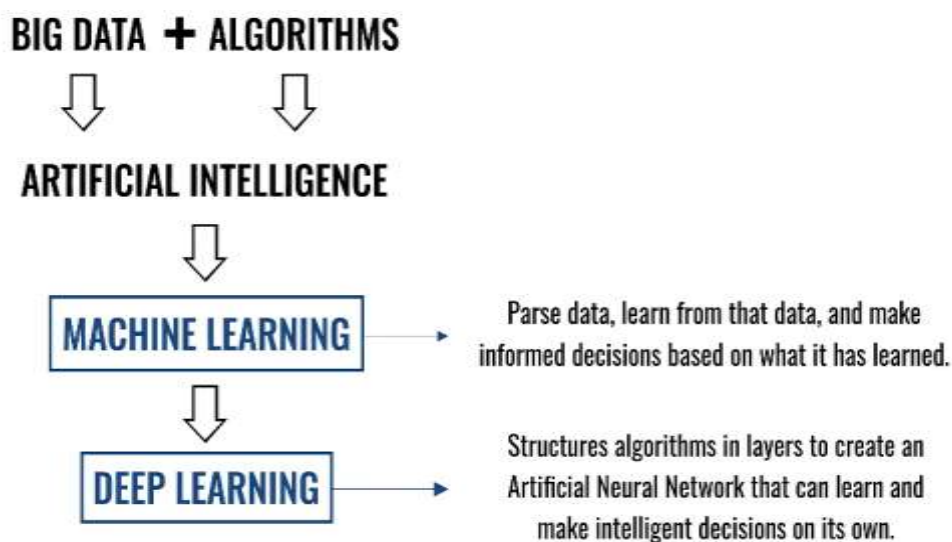

Figure 3: Machine Learning Vs Deep Learning

Artificial intelligence, often known as machine intelligence, is the emulation of human intelligence in devices that have been designed to think and behave like people (PXL

Vision, 2021). Machine learning and deep learning, two crucial AI techniques, can be accomplished by leveraging enormous amounts of data and algorithms. The general word "AI" encompasses both concepts. However, a branch of artificial intelligence known as machine learning use algorithms to separate data, learn from that data, and then make wise decisions based on what it has discovered (Alexander, 2019). On the other hand, deep learning, a branch of machine learning, organizes algorithms into layers to produce an artificial neural network that is capable of self-learning and deductive reasoning (Alexander, 2019).

AI is being used more than ever across different jobs and industries. In fact, we are in touch with it every day, even if we do not notice it. Whether users are watching our Netflix movie suggestions or unlocking our phone with Face ID and as President and it has been allowing businesses to become more innovative, flexible, and adaptive than ever. But how it can be applied in marketing, starting with social media.

- Social Media advertising is one of the marketing areas where artificial intelligence was effectively implemented by utilizing AI and machine learning platforms such as Facebook or Instagram can examine their users, information and interests which allow them to personalize the content and ads that show on users feeds this technique (Digital Marketing Made Easy, 2021).

- AI is also being used by streaming platforms such as Netflix and YouTube and retailer websites such as amazon which use past purchases or viewing history to improve their recommendation engines (Digital Marketing Made Easy, 2021).

- Chat bots are assisting online stores by providing 24/7 customer service. They have been improved over the years and by using machine learning and AI chat

bots are now able to give human like replies to basic questions in real time. Lastly comes predictive analytics. One of the main advantages of AI in marketing is its ability to predict sales and foresee customer behaviors. With big data, companies can now foresee future results and adjust for marketing strategies and tactics based on those, which can lead them to better outcomes. (Digital Marketing Made Easy, 2021)
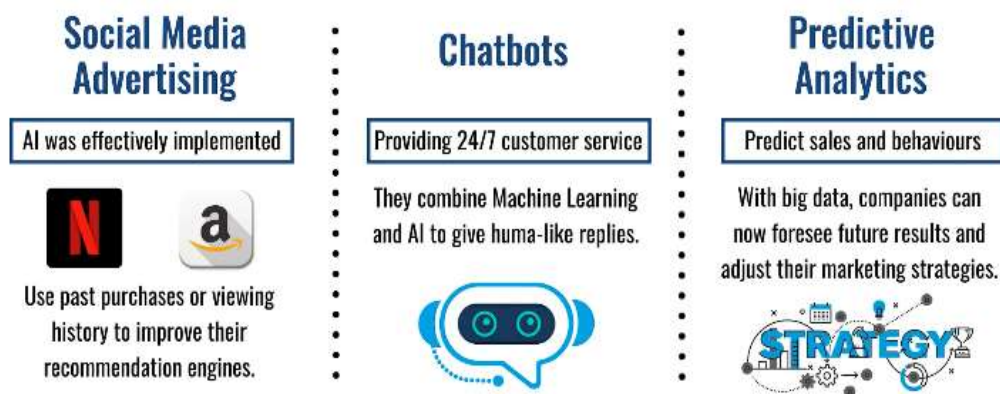
Figure 4: How Can AI Be Used in Marketing (Digital Marketing Made Easy, 2021)

2.7 Contexed based Algorithms

One of the most widely used algorithms in AI is context-based algorithms. Using this algorithm, we can understand users' behavior and their likings and their interests. What we are trying to achieve is to impose better options meeting the user needs. It is important to avoid the unnecessary data from a user experience (Alaiad & Zhou, 2017). This algorithm is purely based on historical data and the tools that we can use to extract data play air important role in this concept. Storing data is also another aspect to consider. (Costagliola, DeRosa, & VittorioFuccella, 2014) Each user has various types of data to propose well using your product or service (in this case and marketing website). The more information you store from your users the more data with which

you must work. The understanding of how to use this data to benefit your quality of products or services is a subcategory of data science. The more advanced you are in extracting data from your historical data the better AI will work with the context-based algorithms. (Costagliola, DeRosa, & VittorioFuccella, 2014)

2.7.1 Contexed Based Algorithm Demonstration

In this scenario I will demonstrate how context-based algorithms may work in a website. Consider a website for streaming movies. Each user will create an account and login with their basic information. The more time they spend on the website and interacting with different features the more data with which you must work. therefore, having an engageable website would benefit you with storing more data. The suggestions for a new user we will be the most trending items or movies now in the market. This is a starting point for a newly registered user to start with. From the first suggestion we can see some traits and tags in their choice. Based on their second selection we might find some identical traits with the first one. Based on their third selection we can see more detailed identical traits in their choice. Eventually we create and database containing all the similar traits which were contained in different items. Using those items, we can understand their likings and preference. From a certain point where we have enough data to work with and predict future suggestions for this user, we can start suggesting movies which the AI believes that the user will like more.
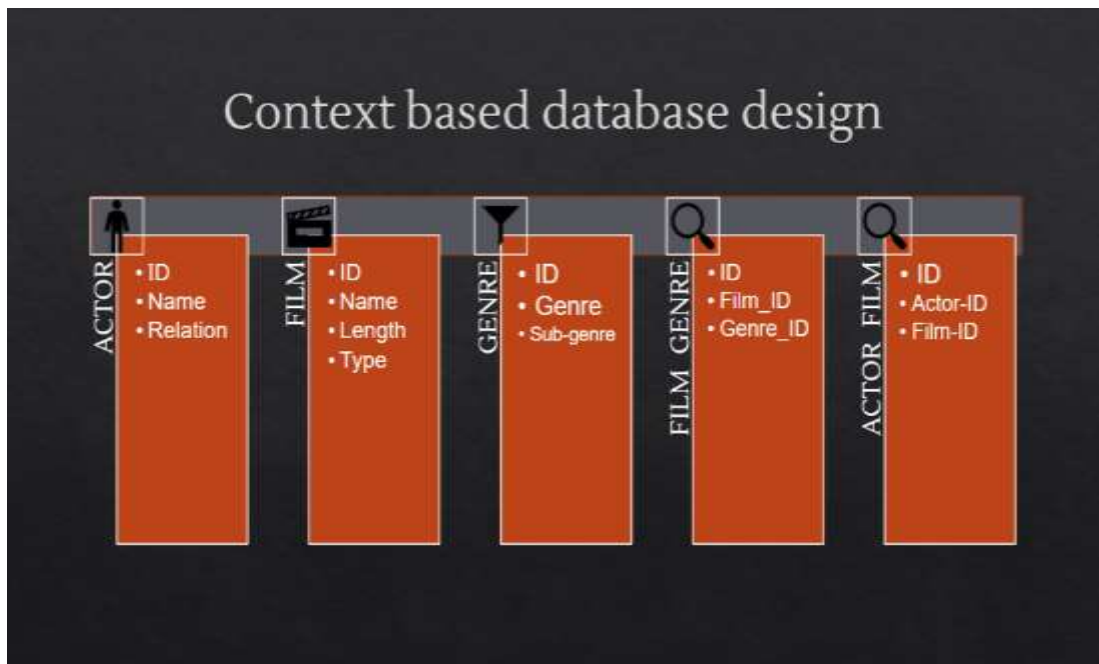
Figure 5: Contexed Based Diagram Design

Some of the important aspects of this algorithms which can cause huge problems if they are not thoughtfully designed are well organized dataset for your available items and measurable utilities and traits to assign.

2.8 Pattern Based Algorithms

Pattern based algorithms are also another used algorithm in AI. A pattern recognition method is a statistical analysis technique that uses machine learning algorithms to automatically recognize patterns and regularities in data. The data can be text, images, sounds, or anything else that can be defined (Ma & Sun, 2020). In addition to recognizing familiar patterns quickly and accurately, pattern recognition systems are also capable of classifying unfamiliar objects, recognizing shapes and objects from different angles, and recognizing patterns or objects even if they are partially obscured. Image processing, speech and fingerprint recognition, aerial photo interpretation, optical character recognition in scanned documents such as contracts and photographs, and even medical imaging and diagnosis are all examples of pattern recognition

applications (Kotler & Armstrong, 2018). Data analytics is also based on pattern recognition technologies. The approach, for example, can be used to forecast stock market outcomes. (Zhang & Williams, 2018)
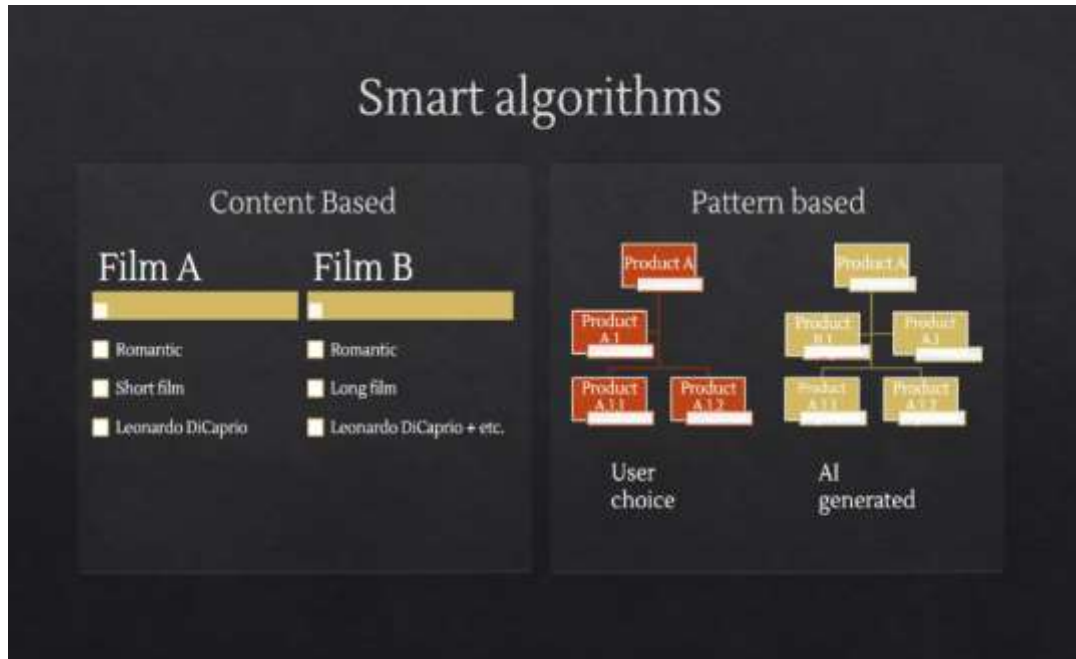
Figure 6: Difference Between Contexed Based and Pattern Based

Pattern based algorithms are not dependent on the context of each item. Traits and features of items are not counted as valuable data. It is more based on the pattern of each user and their experience (Kim & Lee, 2016). Based on this context it is critical to have enough users and UX samples to mine information. Data science in this algorithm play a key role.

The algorithm will learn each user choice and record their actions. Their actions from product A to B represent important data. Some type of user may return to C after reviewing B, and some may continue with A or switch to D. If we have enough samples to study, we will find different patterns and algorithm in users' choices (Godoe & Johansen, 2012). We will be able to categories and give each group of users some

personality and features. Using this feature, we may provide additional information to users in order make them experience much more enjoyable and relatable. (Digital Marketing Made Easy, 2021) A demonstration of this process is provided below:
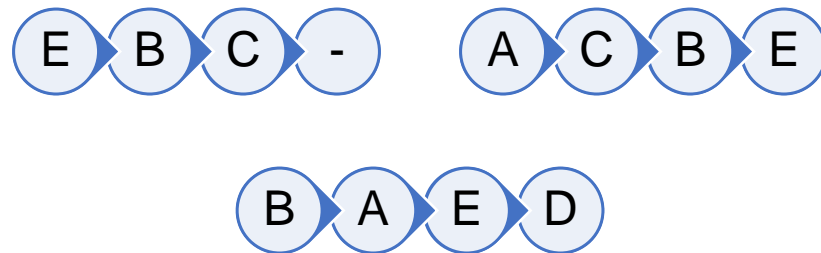
Figure 7: Pattern Based

Assume 5 type of products which are not relatable represented by A, B, C, D, E. Assume 100 users start with product A and jump to product C then to B then to E, 200 starts with B jumps to A to E to D, 250 start with E to B to C. When we are having enough test samples to achieve pattern, we may start to suggest products before they have even chosen to do so. In this case when a new user joins and start with product B, the system will suggest product E to review next and have product D as an alternative. This decision making is based on previous observed patterns. The more data to observe the less error in outcome (AI's coming of age, 2016).

2.9 Predictive Analytics in Marketing

Data mining technique known as predictive analytics makes use of statistical modeling and machine learning to make predictions about the future based on past data. (Digital Marketing Made Easy, 2021) Banks use predictive modeling to decide whether to accept or deny your requests for credit cards and personal loans. However, it also serves other purposes, such as weather prediction, sentiment analysis, recommendation systems, combat filtration, and detection. In the world of marketing,

this approach serves a unique perspective. Imagine if you could not only determine whether a lead is a good fit for your product, but also which are the most promising ROI. This will allow you to focus your team efforts and leads with the higher. This will also include moving away from quantitative measures and toward quality metrics, which will lead to a greater emphasis on timetable. A financial services company may choose which credit card to give and when to do so by analyzing thousands of data points generated by your internet activities. Or, depending on the jacket, what a fashion retailer. Simply said, it may utilize your data to determine which shoes to suggest you buy as your subsequent purchase based on the historical behavior of other consumers (What is cluster analysis , n.d.).

The ramifications, however, go far further than that. Every time we enter a search term, retailers can anticipate demand and ensure that they have the appropriate amount of inventory for each of their products. It is a successful strategy for Amazon. In order to fully utilize the potential of artificial intelligence and predictive analytics, we are always feeding data into the computer.

There are four elements that organizations need to put in place (Alexander, 2019):

1. **Right metric**: It is crucial to be able to ask for the correct data and requirements to ensure a clean and useful dataset. The key point of having a dynamic and smart database is to have an efficient and optimized inquiry system.

2. **Right data:** We have come a long way in terms of data. 90% of all the world data has been generated in the last two years, but a complete and clean dataset is required to arrive plausible conclusions. It is important for you to figure out what data is available to you and whether it will be sufficient to answer your questions convincingly.

3. **Right technology**: You must ensure which software and which technology to use to bring you closer to your goals and objective. Due to expansion of technology, there many tools and options to choose from. This indicates the importance of having the right set of tools for your work.

4. **Right people**: In order to determine which goods are likely to run out of stock and which underperformed, Walmart immediately adds data from their system into its prediction. This gives Walmart a ton of data points to help it prepare for forecasted changes in product demand, especially when combined with user online data entry activity data. Walmart is able to customize its online appearance because to this. attracting people to particular items depending on their anticipated propensity to make a sale.

2.10 AI And Blockchain in Application Development

Blockchain started with Bitcoin, a decentralized digital currency based on distributed Ledger technology then entered a theory which allowed developers to write programs smart contracts on top of what Bitcoin blockchain provides. (A Beginner's Guide to Smart Contracts, 2018). Traditional smart contracts will get artificial intelligence through AI, making them really intelligent. On the one hand, AI model developed by AI developers is stored on the blockchain's storage layer. The AI virtual machine's architecture shifts tasks from the CPU to the GPU or the FPGA, making it AI-ready. These AI models may then be accessed and used by DApp (Decentralized app developers) developers by paying using a crypto token like Ethereum, bitcoin, or other native cryptocurrencies in figure 7 (Xavier, 2017).
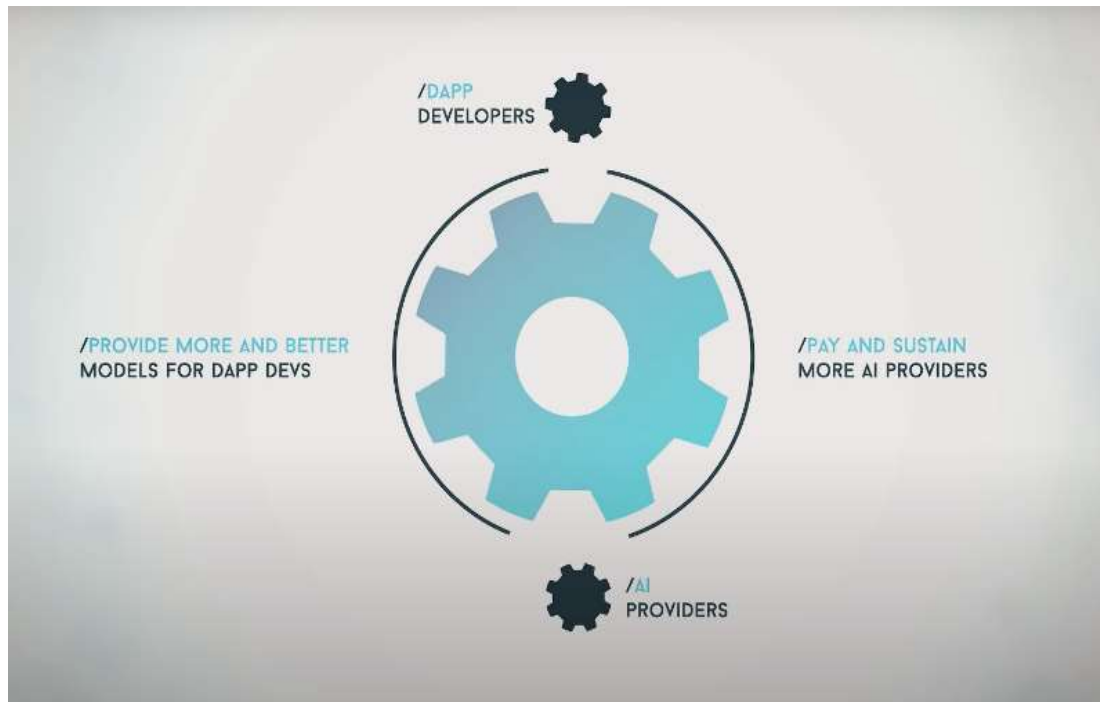
Figure 8: Dapp Developers Cycle Based on AI And Blockchain
(What is a Dapp?, 2018)

Ex: "Programmer A" has trained an AI model for facial recognition. He submits it to the cortex storage layer. Meanwhile, "programmer B," who is writing a decentralized payment, can use this model in her app to verify users, and she pays programmer A in crypto token or coins each time the model is used. (PXL Vision, 2021)

Such an infrastructure will rebuild the world of AI ecosystem in a way that developers pay and sustain AI development and developers are incentivized to provide more quality AI models to adapt.

2.11 Smart Contracts

Blockchains have their issues, but they are undeniably faster, cheaper, and more secure than traditional systems (Ali, Matar, & Jawad, 2015). Therefore, large banks and governments are turning for innovative solutions against slow and labor-intensive bureaucracies. In 1994, Nick Saban, legal scholar, and cryptographer, wrote about how

self-executing contracts with smart contracts could be developed with a clever use of cryptography, digital signatures, and secure computation. He realizes at the time the vast potential contracts that could be created and executed digitally, an idea while avoiding the services of the middle. (PXL Vision, 2021) Ordinarily you would go to a lawyer, or the government pay them and wait to get an important document. To describe how smart contract works, it can be compared to a vending machine. You simply input your information into the vending machine or the smart contract and your personalized driver's license rental contract or any other type of agreement drops out into your account. Smart contracts can be used to fund the rules and penalties around these agreements in the same way that a traditional contract does (Use Cases of Blockchain, 2022). But it can also automatically enforce them.

2.12 Decentralized Application Development

Imagine being paid for browsing the web by taking ownership of your data and developments in that world is not far away. Bitcoin enforced the community to reassess the definition of currency, it introduced a sneak peek of the future (Goel, 2022). A world running on decentralized applications. The concept is still in its infancy. There might not be one definition of the concept, but there are some key features to maintain:

- **Open Source**: Ideally, all chain should be decided by user and developer consensus and its code base should be open discreetly. (Use Cases of Blockchain, 2022)

- **Decentralized**: All records of the applications operation must be stored on a public and decentralized blockchain to encourage transparency, trust, and efficiency. (Use Cases of Blockchain, 2022)

- **Incentivized**: Anyone that helps secure the applications should be rewarded with cryptographic tokens. (Use Cases of Blockchain, 2022)

To summarizes and mention as much as possible, here are some keywords and brief description:

- **Trust**: Big corporations, marketing, or PR agencies, all the code is open source, so you can see for yourself what the application does and how it does. (What is a Dapp?, 2018)

- **Guaranteed Execution**: Code is executed across an enormous network, you will get the desired results if a single node exists, the network. This technology will never go offline if your code exists on it. Based on reports from before, sometimes companies' servers such as Facebook (Meta) or YouTube are down. This breakdown is almost impossible in the world of blockchain. (What is a Dapp?, 2018)

- **Censorship Resistance**: Another benefit of having the code stored and executed on the blockchain is that it is impossible to takedown an application without taking down the network. If you release a banking application, that is better and cheaper than the bank, the bank cannot buy it and shut it. Application will always live on the blockchain for everyone to use. (What is a Dapp?, 2018)

Many businesses today are built around the idea of centralization. If you create a safe and secure platform for people to transact, then you can take a cut of the transactions and exchange the facility (What is a Dapp?, 2018). But with blockchain this is no longer needed. So far Bitcoin has proven that no authority is required to ensure a safe transaction. Considering this statement, some businesses find the urge to use innovation in their field of service to maintain their business. Decentralized applications have put middleman-based businesses on notice. The fact that many large corporations are hurrying to secure their place in the launching serves as a testament

to their possibilities is truly the sign of their notice to improve and be more innovative

(Use Cases of Blockchain, 2022).

Chapter 3

MEHODOLOGY

This section describes the process for data collection, compare and combine the results of previously done research in field of Cryptocurrencies and AI technology in retail stores.

3.1 Method In Cryptocurrency

This study's main goal was to compare and combine customer behavior in using AI Powered Retail Stores and their readiness while having bitcoin adoption in retail from the perspective of the vendors. This study looks at the personas and spending patterns of merchants and shoppers who use cryptocurrencies worldwide. Examining client experiences and their acceptance in AIPARS and observing merchants accepting bitcoin payments are the main subjects of this study.

According to Journal of Economics and Administrative Sciences (Temizkhan, Yetgin, & Yilmaz, 2022) the study's conclusions were derived from interview data collected via video conference. The video and audio recordings from the videoconference program were converted into text for each 45-minute interview. The study's qualitative data were the responses to the interview questions, and its quantitative data were the different sorts of sectors. Within the framework of Rogers' Theory of Diffusion (Dibra, 2015) of Innovation, this study examined shopkeepers' perceptions of who accepted cryptocurrency payments.

Table 1: Profiles and Overview of Respondents (Temizkhan, Yetgin, & Yilmaz, 2022)

Age	Gender	Education	Frequency of receiving payment with cryptocurrency	Interest toward new technology	Sector
`	M	BA	4-5 per year	Good	Tourism
56	M	MSc	3-4 per year	Excellent	Printing press
40	M	BSc	2-3 per year	Excellent	IT
36	F	PhD	2-3 per year	Excellent	Graphic design
51	F	High School	Once a year	Good	Real Estate agency
58	M	MA	Once a year	Excellent	Education

3.1.1 Knowledge Stage

The knowledge stage consists of lessons on innovation. To determine the novelty and uses of the innovation, what, why, and how questions are posed. In this study, the businesses who participated in the interviews discussed their experiences with regard to their motivations, consumer understanding of bitcoin use in retailing, and consumer awareness of it.

According to Rogers (2003), the essential elements of information collecting at this point are awareness, how-to knowledge, and principles. Understanding how to do something is essential for sophisticated technological advancements. It is also essential to comprehend the causes behind an innovation's emergence (Sahin, 2006).

The implications of the interview subjects are consistent with those of Jonker (Jonker N. , 2019) who claims that greater awareness enhances the use of cryptocurrencies in shopping. The consumer must first be informed that cryptocurrencies exist. If the data they gather is accurate contains unfavorable content, they'll probably be prejudiced

towards cryptocurrency. The individuals who as a result of prejudice brought on by unfavorable knowledge, bad attitudes and actions will develop. Most people were hesitant to reveal their real names and last names on Facebook in the beginning (Breslin, 2022), but today people gladly share their birthdays, a lot of personal information, and experiences from their daily life. People also need to have enough "how-to" knowledge in order for difficult inventions to be embraced. Previously, using the internet and later mobile banking was difficult; but, today, even stock exchange transactions may be completed swiftly using a smartphone application. When it comes to cryptocurrencies, a person may have all the necessary knowledge, but it is not always mean they will adopt innovation because personal traits and attitudes can also influence whether someone adopts or rejects a new idea.

3.1.2 Persuasion Phase

The persuasion phase begins when someone has a pro or con attitude toward innovation. However, a person's attitude does not always determine whether they would embrace or reject an invention (Rogers, 2003). Both the knowledge stage and the persuasion stage are understood to be cognitive processes. Individuals' views and opinions about innovations are influenced by uncertainties around the functions of innovations and social and environmental judgments. Close friends' subjective opinions have greater value for individuals (Palacios, 1997).

The decision to adopt is influenced by the social structure. Owners of participating businesses claim that encouraging statements made by well-known international investors boost public confidence in cryptocurrencies. Higher levels of trust facilitate the adoption of technology, according to the study's findings, which confirm this claim made by Al Bayati et al. (2020).

With its system working independently of any bank, Bitcoin can be seen as a danger to the functionality of banks, despite the fact that it is not yet at the core of payment tools and systems. In the area of international fund transfers, it has a competitive advantage. Bitcoin serves as a crucial investing instrument in addition to being utilized as a payment method. Despite its quick oscillations that cause appreciation and loss, Bitcoin has made its investors a lot of money since its inception. Some commentators claim that the majority of Bitcoin purchasers solely purchase it for investment purposes. One of the perceived hazards is rapid value change (Meredith, 2015).

3.1.3 The Decision Stage

The individual decides whether to accept or reject the innovation during the decision stage. Rejecting an innovation suggests that you do not embrace it, whereas adoption refers to using it fully (Rogers, 2003).The ability to test innovations in small batches hastens their uptake. Rejection is a possibility at every stage of the innovation-decision process. Passive and active rejections are the two categories that can be discussed. Active rejection is when someone tries a new idea but ultimately decides against adopting it because of past experiences. When someone is passively rejected, they don't even think about adopting (Temizkhan, Yetgin, & Yilmaz, 2022).

According to Roussou and Stiakakis (2016), some individuals decided to utilize bitcoin because of their interest in technology. Numerous survey participants, however, indicated that they waited to utilize cryptocurrencies and assess the results until after others had done so. Studies on freedom and the major causes that encourage or drive people to utilize Bitcoin include mistrust of the banking system. Lack of knowledge, fear, and other factors are what seem to be holding individuals back from

using bitcoin. Fear of the unpredictability, lack of infrastructure, and issues with bitcoin network (Presthus, 2017).

3.1.4 Implementation Stage

Innovation begins to be put into practice during the implementation phase. The method of spreading invention still has some degree of ambiguity at this point. The key subject of this uncertainty is how using innovation will affect things. To prevent the effects of uncertainties, the user may therefore require the assistance and support of change agents. The innovation-decision process could come to a stop if the "new concept identity" vanishes for whatever cause (Rogers, 2003).

The registration and authentication processes are carried out by central authorities (banks, notaries, and land registry offices) because this verification service is necessary for legal proof. As a result, central systems are required to certify the official transactions, and these central systems are compensated for their services. These human-based systems are susceptible to delays, losses, thefts, slowdowns, and corruption if the central authority is compromised (Presthus, 2017). There may also be a need for numerous people to work here. Smart contracts created on the blockchain can handle any transaction between A and B person, including money transfers, purchases of goods or services, the sale of real estate, and the purchase of automobiles. Multiple computers can simultaneously download the same information. With the help of smart contracts created on the blockchain platform, all transactions that call for verification can be carried out. Transactions may be carried out more quickly, securely, and affordably by leveraging blockchain technology.

3.1.5 The Confirmation Stage

It is the stage where the user looks for support for their choice. According to Rogers (Rogers, 2003), people might alter their adoption choices if they are exposed to conflicting messages about innovation. However, at this point individuals are more receptive to messages that validate their choices. At this point, adoption may potentially be denied. Denial can happen in the following two ways. First, if there is a superior substitute, the decision to adopt may be changed. In the second, people experience adoption denial because they are dissatisfied with how the innovation is performing which is referred to as "disappointment denial" (Temizkhan, Yetgin, & Yilmaz, 2022).

With its system working independently of any bank, Bitcoin can be seen as a danger to the functionality of banks, despite the fact that it is not yet at the core of payment tools and systems. In the area of international fund transfers, it has a competitive advantage. Bitcoin serves as a crucial investing instrument in addition to being utilized as a payment method. Despite its quick oscillations that cause appreciation and loss, Bitcoin has made its investors a lot of money since its inception. Some commentators claim that the majority of Bitcoin purchasers solely purchase it for investment purposes. One of the perceived hazards is rapid value change (Meredith, 2015).

3.2 Method in AIPARS

Optimism (OMM) is interested in how people see technology positively, believing that it gives them more efficiency, flexibility, and control. OMM is the preference of a person to look for new technologies that are on the (Liljander, Gillberg, Gummerus, & Riel, 2006). Customers that are optimistic about technology tend to have a good outlook on employing new technology and are more willing to accept it. The PEE of

shopping at AIPARS is positively influenced by OMM considering new retail technology.

Innovativeness (INN) is a contributing factor and TR's driver. INN is conceived of as the consumer's exploratory behavior when using technology (Kotler & Armstrong, 2018). Consumers with a creative mindset might believe that using technology is simple for a specific purpose (Godoe & Johansen, 2012). The perceived ease of use (PEE) of shopping at AIPARS is favorably impacted by INN regarding new retail technology.

Discomfort (DIF) raises concerns about the use of new technologies and could have a detrimental impact on people's attitudes toward such use. It may not, however, always have a deleterious effect (Erdoğmu & Esen, 2011) (Martens, Roll, & Elliott, 2017). PEE's decision to shop at AIPARS is negatively impacted by DIF toward new retail technology. The PFL of shopping at AIPARS is negatively impacted by DIF toward new retail technology. PFL of shopping at AIPARS is favorably impacted by INN regarding new retail technology.

Perceived Enjoyment (PEJ) refers to the extent to which using a computer should be enjoyable in addition to achieving expected performance results (Davi, R.P., & Warshaw, 1992). Additionally, it is discovered that PEJ is a significant predictor of customer purchasing behavior. PEJ has a favorable impact on the SHN at AIPARS.

Due to a lack of confidence in the use of new technology, Insecurity (INS) refers to people who do not feel comfortable enough to take use of it. INS is just another unfavorable element and barrier to technology readiness (A. Parasuraman, 2011). INS

hinders the uptake of innovative technologies. PEE's decision to shop at AIPARS is negatively impacted by INS's views on new retail technology. PFL of shopping at AIPARS is negatively impacted by INS over new retail technology.

Customization (CST) is defined as the extent to which a company satisfies the numerous needs of its consumers, and it is a key antecedent of consumer behavior in retail malls, m-commerce, internet shopping, and mobile commerce (Kesari & Atulkar, 2016). CST has a favorable impact on the SHN at AIPARS.

Interactivity (INY) is mostly significant for the communication between customers and businesses. According to the literature, interaction is a prerequisite for consumers' online buying experiences (Cowan & Ketron, 2018) (Pantano & A. Rese, 2017). CST has a favorable impact on the SHN at AIPARS.

AIPARS examines the subjective probability of an individual engaging in particular buying behaviors, while shopping intention (SHN) considers the shopping intention of a person to shop there (M. Fishbein, 1975). PEE has a favorable impact on the SHN at AIPARS. PFL has a favorable impact on the SHN at AIPARS.

Table 2: Measurement model summary (Pilla, Sivathanu, & K.Dwivedi, 2020)

Construct	Measurements	Factor Loading
Optimism (OMM) AVE = .728 CR = .901 α = .821	New retail technologies like AIPARS assist in decent life quality.	0.880
	New retail technology like AIPARS convenient for people.	0.891
	New retail technology like AIPARS helps people to manage their shopping properly.	0.803
	New retail technology like AIPARS helpful in making my life efficient and effective.	0.853
	I like new retail technology - AIPARS as it provides more freedom to me while shopping.	0.893
Innovativeness (INN) AVE = .732	For using new AIPARS technology, many people contact me for help and guidance.	0.889
	Typically, I would be the first person to shop using new retail technology in retail malls.	0.811

CR = .893 α = .807	I generally understand new retail technology in retail malls and do not require help from anybody.	0.895
	I am interested to know the latest trends in technology in retail space.	0.819
	I would experience less issues than others when using modern retail equipment like AIPARS in shopping malls.	0.873
Discomfort (DIF) AVE = .742 CR = .882 α = .812	I think that if someone else is more knowledgeable about retail purchasing technologies than I am, they are taking advantage of me.	0.887
	I have no idea how to use the technical help displays or support boards because they don't reflect how well I understand mall-based retail technologies.	0.812
	I believe that AIPARS and new retail technology in malls are not well built and difficult for a layperson to understand.	0.830
Insecurity (INS) AVE = .737 CR = .899 α = .824	Shopping at AIPARS makes me feel uneasy.	0.840
	When shopping at AIPARS, the human touch is crucial.	0.807
	I'm concerned that if I shop at AIPARS, someone might exploit the information I give them for improper purposes.	0.846
	The presence of people is essential for shopping at malls.	0.855
	The presence of people is essential for shopping at malls.	0.808
Perceived Usefulness (PFL) AVE = .737 CR = .879 α = .824	Saving time by shopping at AIPARS might be beneficial.	0.862
	Performance in shopping would increase with the use of AIPARS.	0.891
	Shopping would go more quickly if you used AIPARS.	0.846
	My ability to shop more efficiently would increase if I used AIPARS.	0.873
	My shopping transactions at AIPARS are simpler.	0.841
	AIPARS would be helpful overall for shopping.	0.875
Perceived ease of use (PEE) AVE = .747 CR = .876 α = .821	I find that using AIPARS to purchase and operate is easy and hassle-free.	0.864
	At AIPARS, shopping for what I want to buy is simple.	0.890
	The AIPARS is easy to use and understand.	0.871
	I have no trouble recalling how to complete activities in AIPARS.	0.886
	Overall, I think AIPARS' online store is easy to use.	0.823
Perceived Enjoyment (PEJ) AVE = .713 CR = .874 α = .831	AIPARS is a wonderful place to shop.	0.861
	Shopping at AIPARS would be exciting to me.	0.865
	Shopping at AIPARS would be an exciting experience for me.	0.863
	I like to shop at AIPARS.	0.888
	Shopping at AIPARS would be calming to me.	0.810
	AIPARS would offer purchasing choices that suited my needs, which would be fun for me.	0.823
Customization (CST) AVE = .798 CR = .923 α = .815	At AIPARS, shopping for what I want to buy is simple.	0.867
	I would be able to buy things that are right for me because to AIPARS.	0.862
	My buying needs are completely met by the promos and advertisements that AIPARS offers.	0.866
	I would have a unique consumer experience thanks to AIPARS.	0.829
	I have faith that AIPARS will be modified to meet my needs.	0.852
Interactivity (INY) AVE = .745 CR = .921 α = .817	I would be able to view the goods from various perspectives thanks to AIPARS.	0.855
	I would be able to find products with the help of AIPARS' search tools.	0.830
	AIPARS has tools that make comparing products simple.	0.821
	Attractive shopping is available at AIPARS.	0.814
	AIPARS is a really lively place to shop.	0.812

Shopping Intention (SHN) AVE = .733 CR = .882 α = .835	For my shopping, I'll go to AIPARS.	0.845
	I'll probably recommend AIPARS to my friends.	0.833
	I'll use AIPARS if I own a store.	0.823

3.2.1 Data Analysis and Results

According to the findings (Ali, Matar, & Jawad, 2015), OMM significantly affects the PFL and PEE of AIPARS, in contrast to the findings of a prior study (Kumar & Mukherjee, 2013), which claimed that OMM has no impact on the PFL of new technology. As they already use some sort of technology to shop in retail shops, customers are hopeful about the PEE and PFL of AIPARS technology in retail establishments. According to (Ali, Matar, & Jawad, 2015), the INN of the persons has a favorable impact on PEE and PFL (Godoe & Johansen, 2012) , demonstrating that customers have an innovative mindset and believe AIPARS technologies are user-friendly and helpful for purchasing.

The findings contradict the studies on self-service technology and state that DIF has no impact on PEE and PFL of AIPARS (Kallweit, Spreer, & Toporowski, 2014). Customers don't feel uncomfortable because they are familiar with using the technologies seen at shopping malls. As a result, DIF has no impact on PFL or PEE. INS has no effect on PEE, but it has a negative impact on PFL (Parasuraman, Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, 2000) (Godoe & Johansen, 2012), demonstrating that customers are concerned about insecurity. PEE affects the PFL of shopping at AIPARS (Roy, Balaji, Sadeque, Nguyen, & Melewar, 2017). The behavioral intention to shop

at AIPARS is favorably influenced by PEE and PFL, indicating that customers have this goal.

Due to customers' perceptions of fun and enjoyment when buying at AIPARS, PEJ has a favorable impact on the SHN there, which supports the research of online shopping (Chen & Hsu, 2018). CST promotes m-commerce, retail malls, and the (Kesari & Atulkar, 2016). Due to AI-based technologies, AIPARS offers customers more personalized services. INY has a favorable impact on SHN, which communicates that there is a high level of interaction thanks to AIPARS technology. INY therefore has a favorable impact on SHN (Park, 2012).

3.3 AI In Software

AI is a powerful tool to be used in segments of an Ecommerce business. But its true potential would reveal only if it's implemented in every aspect of an organization. For example, in addition to coding, hardware, data analysis, data recognition, robotics and automation. AS an instance, with every hour E-commerce giant Amazon Records average sales of more than $70 million. (Inner Machinations, 2021) How can such a huge marketplace manage to market and sell that many commodities to each individual when Amazon offers more than 12 million single products to customers globally? To start, Amazon should offer users the most specialized product recommendations currently available. Their recommendation engine accounts for about 35% of all product sales. (Breslin, 2022) The recommendation engine is an efficient application of Artificial intelligence that uses a person's prior search history, purchase history, and online usage patterns to establish their product preferences and preferred categories. As an example, the recommendation system will suggest appropriate accessories, such

as a laptop bag wireless keyboard or any other things of a like nature, when a customer buys a laptop.

These improvements will fall in the field of software and coding with assistance of machine learning and data analysis.

3.3.1 Predictive Analytics and Cluster Analysis

A type of technology called predictive analytics generates forecasts regarding some future unknowns. It uses a variety of methodologies, including artificial intelligence (AI), data mining, machine learning, modeling, and statistics to arrive at these conclusions. For instance, data mining (used in the Amazon business model) entails the examination of enormous data sets in order to identify trends.

When developing a new campaign, those in this profession consider how customers have reacted to the overall state of the economy. They can assess if the current selection of products will persuade customers to buy by using these changes in demography. (Halton, 2021)

There is a slight difference to keep in mind. A common misconception is that predictive analytics and machine learning are the same things. Predictive analytics help us understand possible future occurrences by analyzing the past. At its core, predictive analytics includes a series of statistical techniques (including machine learning, predictive modeling, and data mining) and uses statistics (both historical and current) to estimate, or predict, future outcomes. (Halton, 2021)

In addition, there is a completive concept adjacent to Data Analysis referred as Cluster Analysis. It is a statistical method for processing data and can be a powerful data-

mining tool for any organization that needs to identify discrete groups of customers, sales transactions, or other types of behaviors and things. (What is cluster analysis , n.d.) For example, insurance providers use cluster analysis to detect fraudulent claims, and banks use it for credit scoring. It works by organizing items into groups, or clusters, based on how closely associated they are. The most common use of cluster analysis is classification. Subjects are separated into groups so that each subject is more like other subjects in its group than to subjects outside the group. This is a great tool for database designers and classification for Ecommerce business models. In a market research context, this might be used to identify categories like age groups, earnings brackets, urban, rural, or suburban location.

3.4 Tools and Skills

The suggested Blockchain system's architecture and security are designed by a core blockchain developer. In essence, the Core Blockchain Developer lays the groundwork for further construction by others.

Of course, the developers of blockchain software are those that build apps, particularly decentralized (DApp) and web-based applications, using the fundamental web architecture they established. (Terra, 2022)

It's possible that there will be instances where the same individual does both duties, most commonly in small businesses where it's common that employees frequently wear many shoes. In any event, the duties, and obligations of a Blockchain developer on a daily basis are:

- Blockchain design protocol
- Create a backend using Blockchain technologies

- Create a network architecture that may be used to centralize or decentralize data

- Creating and monitoring smart contracts

- Creating front-end designs in accordance with customer specifications.

3.4.1 Blockchain Developer Mindset

It might be helpful to become familiar with the types of mindsets that are most appropriate for Blockchain developers before we delve into certain two different types of aspirations. After all, the distinct problems of Blockchain development necessitate a distinct style of thinking.

No self-respecting company wants to do business with hackers (well, except for ethical hackers) you rarely hear the word "hacker" used in a good context. However, good Blockchain engineers are often those who have a hacker mentality. That's because hackers frequently think creatively rather than conventionally when presented with challenges and obstacles. (Terra, 2022)

A skilled Blockchain developer can also collaborate and work well in a team. In a related vein, the perfect Blockchain developer knows when to seek assistance and when to persevere alone until they find the solution.

The ideal candidate for Blockchain development is a team player who is aware of his or her limitations and has a creative approach to solving issues.

3.4.2 Required Programming Skills in Blockchain

A competent Blockchain developer should feel at ease with several different programming languages. Languages like C#, C++, SQL, JavaScript, and Python are suitable examples.
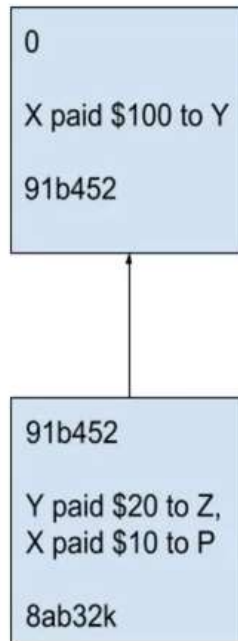
Figure 9: Blockchain Figure (Goel, 2022)

3.5 Blocks And Chains

There are different parts to blockchain coding. The primary parts are "**index, timestamp, data, previous hash".** In different cases of design these indicators will differ. They might be more detailed. But these are the essentials to writing a block.

```
class Block{
    constructor(index, timestamp, data, previousHash = ''){
        this.index = index;
        this.timestamp = timestamp;
        this.data = data;
        this.previousHash = previousHash;
        this.hash = '';
    }
}
```

Figure 10: Creation of Blocks in JavaScript (Xavier, 2017)

- Index: Indicates as the numbering for the current block. It is different than Hash.

- Hash: The encrypted block of data indicating the blocks ID. In easier words, it is a primary key of the block. Hash data are shared between blocks to sustain their connection and chains.

- Timestamp: The date or time that the block is created. It can be detailed in different scenarios. Some blockchain designs requires a daily bottomed indication. But in cases like cryptocurrencies, it must be limited to microseconds.

- Data: It is containing all the material that the block was designed to hold. Data may contain of multiple parameters and arrays. In general sense for simplicity, it is called data.

- Previous hash: This will refer to the previous blocks hash. Similarly, to a foreign key. This property will ensure the security of blockchain. It must always be connected to its previous block (The first block will remain unconnected since it is the first block).

The first block of each block is the only unconnected block. This block is called **Genesis Block**. The previous hash parameter of this block can be 0000 or it can be a random number. In all cases it must be ensured that this number will not be override by any other blocks in the blockchain.

```
createGenesisBlock(){
    return new Block(0, "01/01/2017", "Genesis block", "0");
}
```

Figure 11: Genesis Block Creation in JavaScript (Xavier, 2017)

It is important that the hash parameter is contained with ecrypted data derived from the the essential datas inside the block. There can be different mehtods of encryption. (Eplained in datail in 3.5 Hash Functions). The hash data will be used for fuctions such as "getLatestHash" to accuire the data related to the lates block. Also to verify that the block are connected in order.

```
{
    "index": 0,
    "timestamp": "01/01/2017",
    "data": "Genesis block",
    "previousHash": "0",
    "hash": "4373c7fb1437035365d9228c77eca2cfd240523e274163e78c1eba11effd8b38"
},
{
    "index": 1,
    "timestamp": "10/07/2017",
    "data": {
        "amount": 4
    },
    "previousHash": "4373c7fb1437035365d9228c77eca2cfd240523e274163e78c1eba11effd8b38",
    "hash": "c37ff893464874ffb4cfb0e0da1961786a0fd14ed68157af3a468944d098ecad"
},
{
    "index": 2,
    "timestamp": "12/07/2017",
    "data": {
        "amount": 10
    },
    "previousHash": "c37ff893464874ffb4cfb0e0da1961786a0fd14ed68157af3a468944d098ecad",
    "hash": "dda01bd5f98a793cc0134e3194d8b9b6ca5fa4b001607f5b716bbaad079f7978"
}
```

Figure 12: Blocks of A Blockchain in Code Format (Xavier, 2017)

3.6 Hash Functions

To write codes for blockchain you must be familiar with hash functions. Hash functions ensures security and consistency of blockchain. With hash functions you can:

- Encrypt and decrypt data inside a block

- Check for uniqueness of blocks and ensure no data has been forged.

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3.6.1 Hash Function Types

There are many different types of hash algorithms such as "RipeMD, Tiger, XXHash" and more, but the most common type of hashing used for file integrity checks are MD5, SHA-2 and CRC32. (Conrad Chung, n.d.)

SHA-2 – SHA-2, developed by the National Security Agency (NSA), is a cryptographic hash function. SHA-2 includes significant changes from its predecessor, SHA-1. The SHA-2 family consists of six hash functions with digests (hash values) that are 224, 256, 384 or 512 bits: SHA-224, SHA-256, SHA-384, SHA-512, SHA-512/224, SHA-512/256. SHA-2 is the hash function used in the demonstration of the blockchain in section 3.4.

```
calculateHash(){
    return SHA256(this.index + this.previousHash + this.timestamp + JSON.stringify(this.data)).toString();
}
```

Figure 13: Definition Of SHA-2 Hash Function in JavaScript (Xavier, 2017)

In conclusion, hashing is a useful tool to verify files are copied correctly between two resources. It can also be used to check if files are identical without opening and comparing them. (Conrad Chung, n.d.)

3.7 Chat Bots

As technology continues to evolve, more companies are switching from using traditional platforms to doing business online. Businesses are bringing convenience through technology by integrating AI techniques on their digital platforms. Chatbots are one AI method which use. Virtual assistants like Alexa from Amazon and Google Assistant, as well as messaging services like WeChat and Facebook Messenger, are some instances of chatbot technology. (Frankenfield, 2022)

A chatbot is an automated program that communicates with clients as naturally as a human would, hence it is practically free. Customers can contact chatbots at any time of day or week; they are not restricted by time or place. Due to this, many firms that might not have the manpower or financial means to maintain employees working around the clock are attracted to its implementation.

An artificial neural network used by a chatbot powered by machine learning is modeled after the neural networks found in the human brain. The bot is designed to learn for itself when it encounters new conversations and vocabulary. A chatbot can actually respond to more questions and respond to them more accurately as it receives fresh voice or textual dialogues.

As an extra example and explanation, through the Messenger app, Meta (formerly known as Facebook's parent company) provides a machine learning chatbot that enables businesses to engage with their customers. (Frankenfield, 2022) Users may order a trip from Uber and converse with The New York Times about current events using the Messenger bot. In such cases the bots would answer the query. (Frankenfield, 2022)

Chapter 4

DISCUSSION AND CONCLUSIONS

4.1 Conclusion And Summation

There is no scholarly research that specifically evaluated the retail industry's use of AI-based technologies, despite the fact that the retail sector is on the verge of adopting high-end technologies like these (Alexander, 2019). The studies that are now available are primarily qualitative or conceptual in nature and focus on smart technologies and their applications from a retailer perspective, such as applications in supply chain management (Voropanova, 2015). This study advances earlier research on consumers' use of RFID and augmented reality (AR) technology in retail settings (Huang & Liao, 2015). Retailers worry about their capacity to provide customers with value if it is adopted successfully (Ali, Matar, & Jawad, 2015).

To better understand consumer purchasing patterns, studies have been done on the use of virtual and immersive technologies in retail stores (Kallweit, Spreer, & Toporowski, 2014) as well as augmented reality apps for shopping. In order to better understand AI-based retail systems like AIPARS from the perspectives of both customers and retail companies, more research is required. Recently, there has been a greater need and focus on examining how smart retail technologies and service innovation are used in the retail industry (Dibra, 2015).

By empirically examining the consumers' purchase intention at AIPARS, it adds value to the existing literature on the adoption of new technologies and responds to the demand for scholarly work in this area. Therefore, this research contributes to the growing field of study on new developments in services employing AI-based technology. The findings of this study have repercussions for the body of knowledge on retail management, customer behavior, and information systems. This article examines the impact of developing technological characteristics on consumer buying behavior in the retail sector with a focus on the impact of AI technology and cryptocurrencies in retail stores on customer shopping intention in an effort to close the theoretical gap.

4.2 Personal Contribution

In theory, the world of AI is already expanding with fast exponential pace. This is bringing humanity to concerns. The belief of being replaced by robots and losing jobs. Technological unemployment is unfortunately a byproduct of progress. As it progresses and takes us closer to new era of technology, some technological jobs may have been replenished and be replaced by newborn jobs based new requirements and needs. The concerns are legitimate, but during this period AI will not nearly be at such a developmental stage that its widespread adoption will trigger mass layoffs. The technology will still be used in relatively niche applications and will not yet achieve a level of critical mass that would threaten employment on a global scale. (AI's coming of age, 2016) With the advancement of AI in technology the rate of growth will even grow faster. Therefore, we could be expecting new fields and era of technology and advancement in late 2050s. On the other hand, there's one key factor which is perquisites to all advancements. Which is "security". This is the part where blockchain will take place and comes in handy.
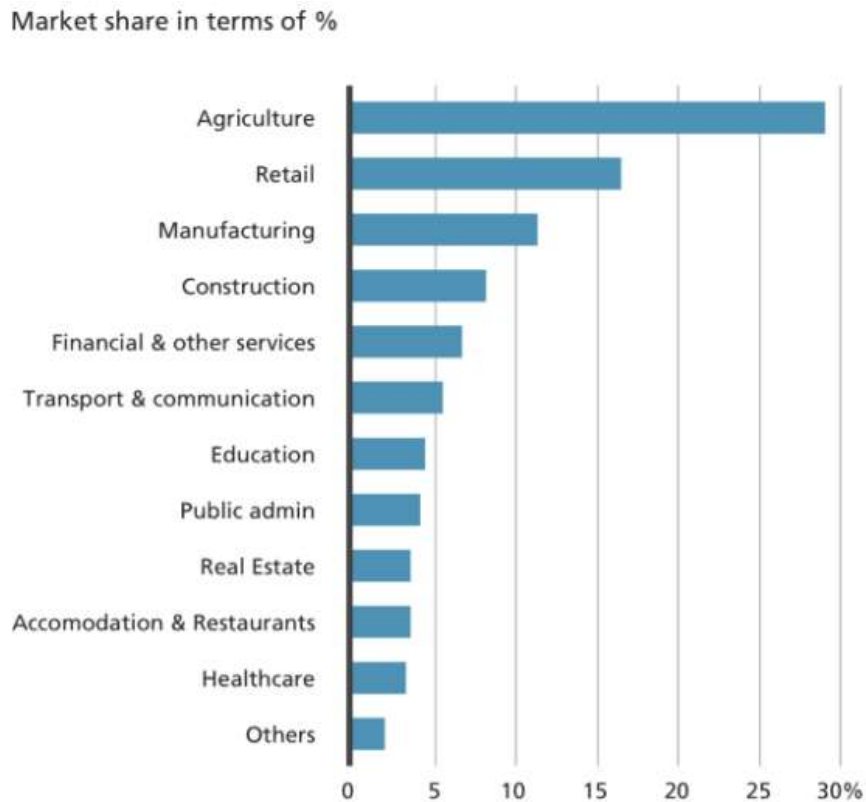
Market share in terms of %

Figure 14: Global Employment by Industry (AI's coming of age, 2016)

Blockchain provides a way to create a tamper-proof log of sensitive activity securely and efficiently. One of the major impacts is capital markets and their boundaries. Political issues and sanctions can all be surpassed. Specially third world countries and countries with boundaries. This makes it excellent for international payments and money transfers.

Again, the blockchain's inherent use of encryption makes it incredibly beneficial in the fight against money laundering. The underlying technology provides record keeping, which facilitates "Know Your Customer (KYC)," a procedure through which a company recognizes and confirms the identity of its customers. (Use Cases of Blockchain, 2022)

Smart contracts are possibly the biggest blockchain use for insurance (A Beginner's Guide to Smart Contracts, 2018). Customers and insurers can manage claims in a clear and secure manner thanks to these contracts. Since the blockchain would reject unsubstantiated allegations on the same accident, all contracts and claims could be recorded there and verified by the network. This would eliminate any claims that were not valid.

In conclusion, the world is rapidly changing, and we are longing for better days to come. With the advancement of technology humans will have more space to focus on obstacle which truly matters to humanity and will clarify the unclear mists. What we are doing today would be worthless and vain if it is not in the benefit of humanity.

In the end, time brings all thigs to pass and there no second chances. Purpose and meaning are not to be found in laws of nature, for it is our job to create them. Because, we are the architects of the future and earth, is our empire.

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